

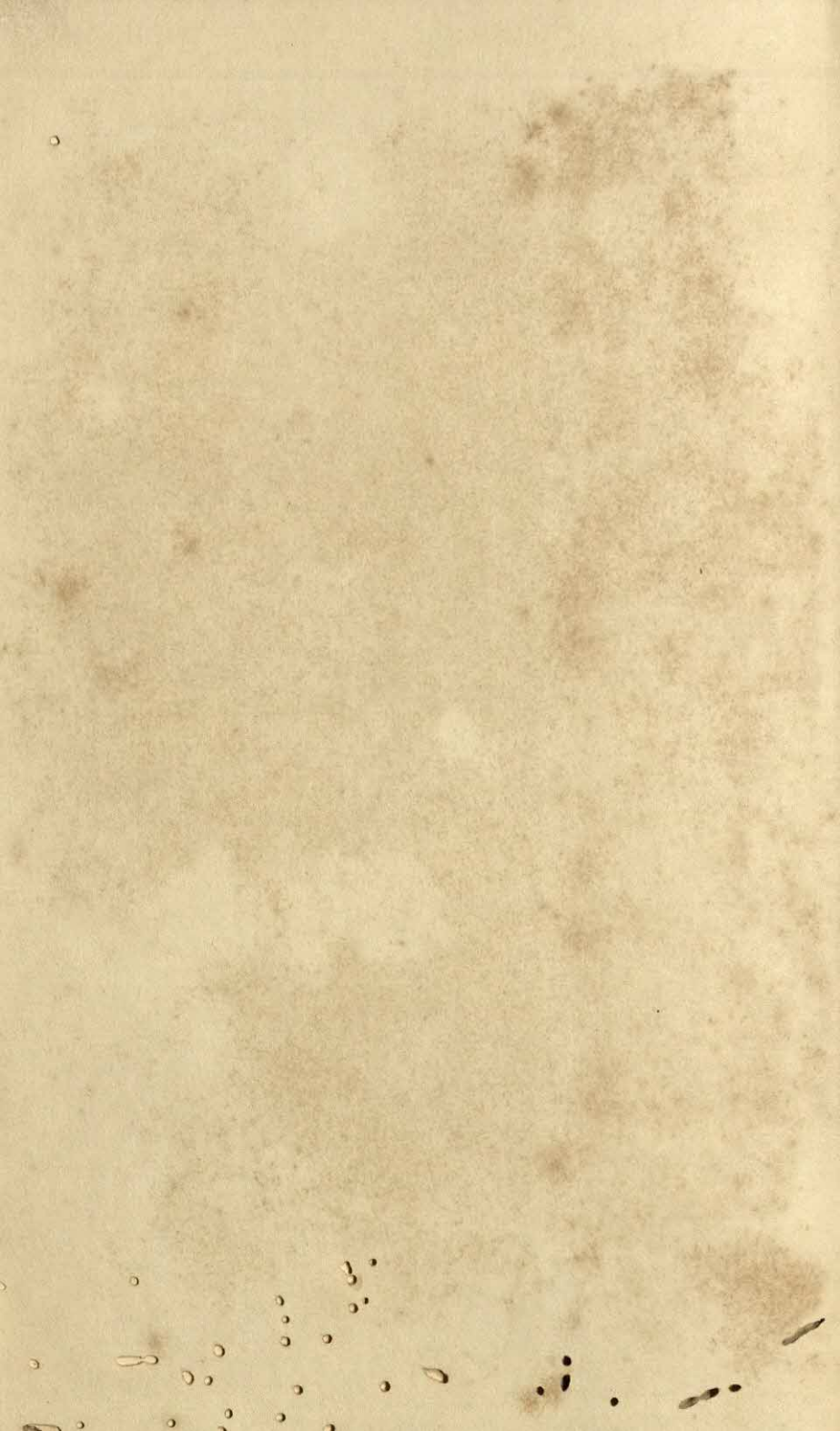
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Communication Media and the School

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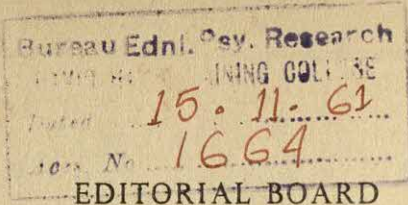
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INTRODUCTION

THIS is the twenty-second issue of the YEAR BOOK OF EDUCATION and the eighth under the joint sponsorship of the University of London Institute of Education and Teachers College, Columbia University. In this volume our contributors have directed their attention to the mass media of communication and their role in education. All countries agree in principle that education shall be universal and that it shall be made available on equal terms to all members of the community. They look with varying degrees of hope and doubt to the mass media as a means of furthering this aim. However much the use of these media will differ according to the needs of the individual countries, there is no doubt they can be used everywhere to great educational effect. There appear to be two quite different approaches to this problem.

The young nations of Africa and Asia have two important objectives; to improve the material well-being of their countrymen and to expand educational facilities, and the relation between these two is obvious. When a large proportion of the population is illiterate, living often at subsistence level in remote regions far from the main centres of government, the difficulties of organizing any form of education are almost insuperable. On the other hand, the mass of the people are unable to improve their lot without education. An acute shortage of school buildings, suitable textbooks and, most important, trained teachers has naturally led governments and educators to consider the mass media of communication as a means of cutting the Gordian knot. In these cases a really major effort in education may be made through the mass media. Whether it be the Rural Forum of All India Radio or the Radiophonic Schools of Colombia, the technique is the same. The role of the teacher or *leader* is, of necessity, subordinate to the medium used, which does, in certain circumstances, actually replace him.

In countries that are technically and economically more advanced, the use of film, radio or television is regarded as an extension or supplement to the work of the teacher. These and other media can quicken the interest and widen the experience of the pupil in a manner that no teacher could achieve without their aid. It is not intended, however, that they should supersede him in the classroom. Much thought has been given to the impact these new media have on the relationship between the teacher and his class, though there is need for continued research in this field.

- * Both groups of nations have one problem in common—how to meet the changes made inevitable by the extensive use of the mass media without destroying much that is worth preserving in the traditional way of life. This is equally true of the United States, where educators have expressed concern about the loss of individuality that may occur with the widespread use of television in schools, and of African states where an over-rapid and indiscriminating assimilation of Western attitudes and values may result in a generation too dislocated to bear well its new responsibilities.

Those who use and control these media (and here we think more particularly of radio and television, although books and newspapers play their all-important part) must bear a special responsibility to the community at large, for the very reason that these media are so effective in creating an attitude of mind, in influencing the way men think. Countless millions have recently acquired a voice in the affairs of their country. If they are to exercise their rights in a democracy they must be able to judge the issues at stake in as unbiased a fashion as possible. The way the facts are presented is of prime importance. In the hands of the unscrupulous the mass media of communication can be a power for evil and democracy itself be placed in jeopardy.

In the international sphere the new media can play, perhaps, their most important role in bridging the gulf between nations. Distance has been rendered insignificant. Man can send a message round the globe in a matter of seconds. The technical barriers to communication have been removed. We can now see our way to removing other barriers—ignorance, suspicion, and distrust. Easy communication between the peoples of the world is the first step towards the frank and honest exchange of ideas which in turn leads to mutual respect and understanding. A new era of peaceful co-operation is in view. These are the problems that are discussed in this edition of the YEAR BOOK.

In conclusion, we wish once more to state our editorial policy: that, while the Editors accept responsibility for the choice of writers for this volume, they have left each contributor entirely free to write out of his own experience and with no suggestion of censorship whatever from the Editors. Accordingly, the responsibility for each article rests with the author over whose name it appears.

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Mass Media of Communication

"SCHOOLS are slaughterhouses of the mind where ten or more years are spent on learning what might be acquired in one . . . places where minds are fed on words." So Comenius attacked verbalism in his *Orbis Sensuallium Pictus*. In addition, he advanced proposals regarded to-day as among the basic principles of modern education. Contrary to prevailing educational theory, he emphasized the unique role of the senses in all learning, and added that good education depended upon the active participation of the learners in the process. Furthermore, to his interest in teaching method and child psychology he added his pan-sophism. His fundamental insistence that "... not the children of the rich or the powerful only, but of all alike, boys and girls, noble and ignoble, rich and poor, in all cities and towns, villages and hamlets, should be sent to school" was indeed a call for a universal system of education.

Of course, Comenius was not alone in attacking the orthodox theories of his day. Francis Bacon, to whom Comenius acknowledged his debt, had also rejected verbalism and stressed the importance of an acquaintance with 'facts'. He also had helped to renew interest in empiricism as the way to knowledge. Both men were indeed products of a period of intellectual renaissance in Europe. Each, in turn, made his own unique contribution to it. During this era, which heralds and indeed blends with modern times, few theories hallowed by tradition remained unquestioned. The courageous men of the Reformation challenged the theological and philosophical doctrines as well as political views of the medieval church and of the schoolmen. Comenius carried this critique into the field of education. He has been described as a "great educator in an age of little ones" because he raised fundamental issues—as important to-day as they were three hundred years ago. Some of them are examined in this volume of the YEAR BOOK.

Emphasis on communication stems from a most significant contribution made by Comenius to educational ideology; namely his belief in education for all. The democratization of learning depends in an important way upon an objective of this kind. Men might justify it in various ways—as an economic or a social necessity, or, better, a

¹ W. Boyd, *History of Western Education* (New York, 1920), p. 321.

fundamental human right of a moral sort. Until the desire exists, at least among some people, to extend educational opportunity to all, irrespective of wealth, sex, circumstance of birth, social position, or religion, little progress is likely to be made towards the realization of pansophic theories. That is to say there is a sense in which ideology, intention, theory—call it what you will—is an integral part of educational change: aims can provide a rationale for reform or they can help to initiate it. Two centuries were to pass before European countries began to accept as practicable the ideal of universal schooling proposed by Comenius. That progress was slow was not entirely because men failed to accept the ideal itself. During the eighteenth century many wished to promote the wide diffusion of knowledge through to establishment of systems of universal elementary instruction. They challenged authority in other ways, too, and were successful in several instances, at least in the political sphere. England advanced towards a system of democratic government; the French revolutionaries overthrew the power of one minority group to replace it by that of another; the War of Independence made possible attempts to democratize education in the United States. Although the opposition to universal education was by no means negligible in any country, by the late nineteenth century there was widespread recognition of it as an ideal to strive for in most European and North American countries as well as in Japan and some parts of Latin America, too. Yet many practical difficulties remained to be solved, and few of them indeed have yet been entirely overcome.

Another relevant contribution made by Comenius was his appreciation of the technical barriers standing in the way of educational progress. His proposal that elementary education should be conducted in the mother tongue was designed to break through one of them. The way to overcome another was demonstrated in his *Januae Linguarum*, which he intended to follow with a treatise on education through things rather than words or even pictures. His illustrated encyclopaedia for children, the *Orbis Pictus*, would, he hoped, make education a delight, arouse and sharpen the interest of children in things around them, and lead them to acquire knowledge for themselves. Like languages, pictures were not ends but means to unlock the doors of knowledge for everyone.

It might be said that Comenius recognized what few educators truly appreciated before Otto Neurath turned his attention to the creation of an international picture language; namely, that words, writing and pictures are all essentially media of communication. They are not, however, freely interchangeable. Each medium has its own characteristics which make it able to serve some aspects of communication

better than others. Yet a recognition of the fundamental identity of general purpose among the media, namely some kind of human communication and discrimination between them in terms of specific purpose, is very necessary. Failure here has probably contributed in large measure to the relative lack of success of attempts to democratize education. To-day, technical progress has made available in a tremendous variety of forms, channels for the transmission of words, writing and pictures. An attempt has been made in this YEAR BOOK to throw light on the educational possibilities and problems thus created.

Barriers to Progress

The history of communication is as long as that of *homo sapiens* himself. The unique characteristic of our species lies in our ability to talk, make meaningful signs and draw pictures. Man has never been able to do all these things equally well; nor has the rate of progress been exactly the same throughout the world. For example, in some countries illiteracy, however defined, is a major educational problem even to-day, while elsewhere it is no longer regarded as such. Some knowledge of the evolution of man's power to communicate, to share with others his knowledge and skill throws light on the general problems which educators face, and is important if the specific problems faced in a particular cultural area are to be appreciated and distinguished from those to be found elsewhere. It is not our intention even to attempt a précis of the story fascinatingly analysed by Lancelot Hogben in *From Cave Painting to Comic Strip*.² We note, however, that at least three types of change were involved. One sequence of changes occurred in the intellectual sphere; over the years man's thought processes, his value systems, his theories, and so on, have evolved. Another sequence might be detected in the realm of his social institutions. In a third group of changes might be placed technical inventions. Evidently relationships exist between ideas, social institutions and scientific or technological inventions, although we need not assume ineluctable cause-effect sequences. In fact, different combinations of these three ingredients are to be found in various parts of the world and at various historical periods. Specific configurations contribute to the creation of specific educational problems.

In the reduction of the number and the height of barriers to the democratization of learning and education, the role of technical inventions should be neither ignored nor minimized. Among those which have contributed to progress a further distinction might be drawn between inventions like symbols and signs and those which

² Lancelot Hogben, *From Cave Painting to Comic Strip* (Parrish, London, 1949).

enable these symbols to be recorded, preserved, transmitted, and reproduced. Without a language, communication is impossible, without paper and pen certain channels of communication are closed. The earliest evidence of man as a communicating animal is found in the pictures he chipped out of stone or ivory with sharp flint instruments. But it is likely that formal education—learning about symbols—was first an aural process. From primitive days the dissemination of tribal lore and customs has gone on by means of the spoken word of the teacher. At another level, in India, the *Vedas* were the basis of all formal education. Some of them were almost certainly composed before the art of writing was known. Even after this invention the sacred literature of India continued to be taught orally. So vast did it become that priestly families began to specialize in their own particular *Veda*. The training of students was long and arduous—perfect recital being expected—so that the novice might stay in the house of his *guru* for as long as twelve years.

This tradition helped to create certain social institutions, notably in India the *caste* system, in which the priestly teachers enjoyed the highest prestige. The services they performed and the esoteric knowledge they possessed strengthened their position. The belief that it was sacrilegious to commit a *Veda* to writing meant that not until the eighth century A.D., long after the invention of a script, was absolute reliance on oral methods sapped.

Over the centuries the authority of the teacher, often ill-disposed to share the source of his power with any other than his few chosen disciples, was replaced by the authority of the written word. Several inventions contributed to this change in emphasis. The original forms of writing were pictures or sign-writings. As in China, these formalized pictures made possible communication between peoples who did not speak the same language or a common language. On the other hand this kind of writing has given rise, in areas where it has been retained, to considerable difficulties as the vocabulary increased in size. Proposals made in 1946 to help China to combat illiteracy required the memorization by all elementary school children of some 3,000 ideograms, an example of the difficulties associated with the use of a sign language. The system of ideograms, tenaciously adhered to for millennia, has begun to yield through modernization and reform. It remains an open question whether this Far-Eastern system will be replaced by romanization, for example, as were the Egyptian hieroglyphs. Some have urged that new inventions such as tape recorders may make it unnecessary to attempt this reform. There are problems associated with picture languages which are reduced when sound-writing is available. At least two types of this kind of writing exist to-day. In one form,

each sound stands for a complete syllable. In the other, an alphabet is used and sounds are represented by combinations of the various symbols. The difficulty of using a syllabary might be appreciated by noting that thousands of different syllable sounds can be dissected out of the words used in the English language.

The Japanese use two kinds of sound-scripts—the *Hiragana* and the *Katakana*. In speech, meaning depends to a very great extent on the context in which the sounds are uttered. Frequently, in order to prevent misunderstanding, a speaker repeats himself, using slight variations of context and word. Apart from the individual difficulties of memorization and the need for repetition in speech, syllabary scripts and sign-scripts are difficult to reproduce in forms which can be made available to the masses. The use of typewriters is well-nigh impossible—the number of different pieces of type is far greater than when an alphabet is in use.

Evidently the educational problems arising from the existence of sign or syllabary scripts are of two kinds. The first of these might be called, as in the case of the oral tradition, socio-political. The authority of words implies a set of social institutions through which the control by those with esoteric knowledge of a written language can be maintained. Secondly, given the desire to make all men literate, there yet remain the technical difficulties of teaching people to use effectively a difficult and somewhat inflexible script. Certainly neither type of barrier can be removed by the stroke of a pen. Frequently vested interests as well as practical educational difficulties inhibit the radical reforms needed.

Notwithstanding the exception of Japan, whose population is literate, it remains true that literacy was first achieved, and most completely, among nations with alphabetic writing. Even so, some three millenia were to pass before the possibilities of establishing universal systems of instruction were seriously considered. "Civilized mankind," according to Hogben,³ "had to surmount many hurdles before it was possible to exploit to the full extent the considerable economy signalized by the introduction of alphabetic writing."

The Greeks had made notable advance in the field of theory. Seminal ideas about the provision and aims of education abound. Of these, the Protagorean view that all men possess civic virtue which can be developed through education, perhaps most obviously anticipated Enlightenment theories about the democratic purposes of education. Although in Greco-Roman society the use of the written word reached an unprecedented level, the oral tradition in politics and education

³ Hogben, op. cit., p. 123.

reigned supreme. From the days of Quintillian the capacity for fulfilling the role of the orator ranked prominently on the list of pedagogical skills. Few could read, still fewer could write. Before there could be any radical increase in their number further technical improvements were necessary. Smoother writing surfaces had to be found as well as better writing instruments. Stone, ivory, and the sun-baked tablets of Babylon had served a purpose, but to copy original inscriptions was laborious and the difficulties of storing or transporting heavy tablets was immense. The use of papyrus as material on which records could be made had already constituted a major advance, since it was not bulky and had a smooth surface. The introduction of paper and of power machinery which could be used to make it rather easily were as necessary as the invention of movable type, suitable type-metal, the right kind of ink, and the printing press in the evolution of printed books, themselves the first major instruments of mass communication.

The oral tradition achieved notable victories. Social developments were made possible through the accumulation and dissemination of information. It was no longer necessary for each generation to learn anew the knowledge already acquired. Traditions were created and preserved. The boundaries of knowledge acquired through direct experience were extended, though they were still drawn rather tight. Communication depended upon the possibility of face-to-face relationships, and these in turn depended upon the availability of means of transportation. Distance and geographical barriers could be overcome only at the expense of much time and in the face of considerable danger. Nevertheless, understandably, information accumulated and was transmitted between groups somewhat isolated from one another by geography. Improved means of transportation consequently were, and still are, a major factor in the spread of information. Not infrequently incentives other than the straightforward desire to communicate, commerce and war, for instance, have promoted voyages of discovery and stimulated research into methods of travelling across the earth. Even the activities of traders and soldiers contributed greatly to the extension in size of communicating groups.

Inscriptions on stone, tablet, or papyrus increased audience size because they were more or less permanent records. Successive generations could consult them. Since most of them were unique documents, there always existed the danger of complete destruction either by natural disaster, military action, or the slow erosion of time. The safe accumulation of information depends on the possibility of duplicating and storing original communications.

Movable type and printing presses were major weapons in the

assault on the fortress of esoteric learning. The many technical inventions already mentioned contributed to the creation of presses which could make a great many copies relatively cheaply for wide distribution. The printers also needed an audience. Of course, they helped to create one, but improvements in glass-making which gave people spectacles and, for their houses, windows, made it possible for more people to read. The navigators, too, wanted almanacks, the men of commerce more adequate means of communication. That is to say, a number of socio-economic changes combined to create a greater demand for printed books than had previously existed. Of them all there can be little doubt that one consequence of the Reformation was to expand the demand for Bibles printed in the vernacular. Even before Luther was born Bibles printed in two German dialects had been published, and in the following fifty years they ran into well over a hundred editions. Certainly the claim of the reformers to base their faith on the scriptures was important in promoting a demand for books but, in addition, their insistence on the need for a universal school, whether under State or Church control, helped to initiate a spate of textbooks for school use.

The Reformation was indeed a movement which effectively initiated the gradual erosion of yet another barrier to the wider diffusion of knowledge. The authority of an institution was challenged. The power of the priestly caste, so long the privileged possessors of esoteric knowledge, was undermined in a way perhaps unique in the history of mankind. Knowledge is power and is the stronger when possessed by only a few. In every society the priestly caste had enjoyed such power to a greater or lesser extent. The oral traditions in education had made possible the retention of power; teachers were able to select exclusively those whom they were prepared not only to instruct but to initiate into their own élite group. To the technical difficulties of learning to read and write were added the expense of copying texts, before the introduction of print. Although the latter innovation removed one set of obstacles, by making available larger amounts of esoteric information, it did not remove the problem of instructing people in the use of books. They had to learn to read and to write. The educational reformers questioned the theories which had served to justify the exclusive retention of information by a minority or élite. Teachers had for long safeguarded their position through insistence on scholarship, through the reservation of schools for pupils chosen for ability or at the behest of wealthy parents or patrons. Technical developments alone would not necessarily have resulted in universal education. They made it more difficult to hold back information by weakening the institutions which controlled the source of knowledge. Indeed, as

methods of duplicating texts improve so that they can be transmitted to audiences of increased size either orally, in writing, or in pictures, the difficulties of retaining control over the process of diffusion increase. Control must rely less upon difficulties of learning a difficult symbolism and more upon political power. Democratic theorists, for example, have for long insisted on the importance of a free Press. The weakening of the barriers due to technical difficulties also tend to weaken political obstacles. Inventions making possible the wider diffusion of knowledge have usually been attacked by power élites—the suspicion, criticism, and denigration of radio, television, and cinema by the upper classes and the most highly educated classes of to-day may perhaps be cited as an example. Attempts have been made to destroy such media or to restrict their use. In the long run the success or failure of such attempts may well depend upon the effectiveness of the invention, not only in reaching a wider public but in the extent to which it improves communication. To-day, to continued conservative recalcitrance—a form of cultural inertia—about the use of new media one might say quite simply: “New media are here to stay. They cannot be dismissed with scorn or peevishness.”

Communication and the Transmission of Messages

The permanence of the Babylonian and Egyptian records, inscribed in brick or stone, did not by itself ensure the effective transmission of messages across the gap for centuries—and this not simply because of the difficulty of deciphering long lost codes. For no message is ever either perfectly simple or perfectly elemental. Sometimes, of course, the chief intention is to record a process or to provide instructions for doing something or other—how to extract juice from grapes or copper from ore, for instance. If the receiver is as familiar as the sender with the appearance and nature of a wine press or furnace, the ‘straight’ meaning of the message will be understood. That is, if those at the two ends of the communication chain are immersed in the same kind of material culture, the main part of the message will be effective. But nearly always other stimuli are included, deliberately or unconsciously, which convey anger, joy, sympathy, or fear. These emotions will not get across unless both transmitter and receptor have experienced the impact of somewhat similar social, moral, and spiritual influences. It is less easy for art lovers of the twentieth century fully to appreciate all that Hieronymus Bosch intended to convey in his paintings than it was for the men of the sixteenth century who were made familiar by their experiences and education with the ‘meaning’ of the symbols he employed.

Thus, the research needed in modern times to interpret hieroglyph or




cuneiform messages is not simply of a linguistic kind, concerned with vocabulary and grammar. It must concern itself with a multitude of cultural factors, with the strands out of which is woven the communication rope. All this is evidently just as true when the problem is that of establishing effective contact between men belonging to different cultural areas as between those from different historical epochs. Is the gap to be bridged between American and Chinese so much smaller than that between Ancient Egyptian and Modern Greek?

At once, in the face of these difficulties, the astonishing power of pictures as a medium of communication springs to mind. How easily do the cave paintings of Altamira and the early Egyptian drawings convey rich meaning! It could, of course, be argued that this meaning is simple and straightforward, having to do only with concrete objects and specific instances. It may well be that an attempt to convey abstract notions, feelings of doubt or uncertainty, general theories, universal views, would leave the recipients confused. After all, modern abstract art is not easily understood by those unfamiliar with the conventions of the art world. Nevertheless, granting all this, the power of the visual is evidently more lasting and more universal than that of the verbal.

Visual communication has in the past oscillated between the naturalistic and the symbolic. By the late Middle Ages, the drawings in herbals and in anatomical books had become highly formalized: plain men could no longer interpret the stylized forms they saw. Then, thanks to the work of artist-scientists like Vesalius, Dürer, and Leonardo, came a swing back to naïve observation and detailed accuracy. This tendency was associated with the revival of empiricism (implying the view that knowledge comes from sense impressions), and with a revulsion from essentialism. Sometimes it was carried so far as to be self-defeating; the unselective realism of Comenius' illustrations, for instance, at times destroys interest and confuses the reader. Communication necessarily implies selection and, therefore, at least to some degree, symbolism. It is for this reason that the drawing is so often superior to the photograph, the cartoon film to the ordinary movie, as an instrument of teaching.

These points were well understood by that visual educator of genius, Otto Neurath. The international picture language he devised depended upon a symbolism deeply affected by and resting upon modern science. It is a language of communication, not a substitute for real things like flowers, animals, or houses. Behind the grammar and the syntax lay an ideal—the international and peaceful society of mankind; a social theory—that of democracy; a philosophy—logical empiricism. His work was a development of the movement initiated by the Encyclo-

paedists of the Enlightenment, and it was supported by the anti-metaphysical analyses of his predecessors such as Ernst Mach or Avenarius. As he himself put it: "We try to avoid symbols which are peculiar to certain countries. We usually prefer age-old symbols, such as the sickle for agriculture—even when the things they represent are rarely used nowadays—because these symbols are readily understood by both children and adults. In short, our symbols are as self-explanatory as possible and you should be able to understand them without the help of words. Isotype symbols may be combined in various ways. Some of these are more or less fixed by rules; others adapted to cases as they arise. For example, the symbols for 'worker' and 'agriculture' may be combined to make one symbol for 'agricultural worker'. . . . In this way we evolved, step by step, a language-like technique which is equally well understood by people of different nationalities—the ever-increasing use of Isotype may perhaps be symptomatic of the spread of certain general trends towards a more cosmopolitan attitude, towards a commonwealth of men united in a human brotherhood. . . ." ⁴ It can perhaps be taken as a testimonial to the cosmopolitanism of the Neurath approach that history textbooks prepared by his Isotype Institute for the use of English children were pirated and used in, among other countries, Japan and Indonesia!

From our point of view, the Isotype method only carries a stage further, though a decisive stage, a trend which has long been common in the sciences. Some symbols, like those for male ♂, and for female ♀, universally recognized by biologists, are of ancient origin. The growth of new sciences led to new techniques of visualization. One example will serve: circuit diagrams in electricity are forms of visualization designed to communicate specific information. In some, but only in incidental ways, part of the symbolism corresponds to the design of the materials used. Connecting wires are lines; resistors ; condensers ; batteries , and so on. A complicated circuit diagram conveys to anyone who has taken the trouble to learn the language a great deal of information. Certainly it does this far more economically and effectively than printed words possibly could. It remains open to question whether or not the same information could, in fact, be communicated in any other known way except by personal demonstration.

As collaborating evidence, experience shows that children whose reading ability is very poor can, by using visualized instructions, build from individual parts quite complicated models. The blue print, like Neurath's language, is fundamentally a medium of communication,

⁴ Otto Neurath. Quoted from an unpublished manuscript.

not an illustration. It serves many purposes: it can provide instructions for assembling circuits, a machine, or a building, or it can aid mathematical understanding by indicating certain physical aspects of the system to which a formula refers.

The possibility of diffusing knowledge more effectively through processes of visualization was taken up strongly during the eighteenth century by the encyclopaedists. Their aim was to spread a knowledge of the arts and sciences among the mass of the people. They intended to centre education round things rather than words, thereby re-echoing the principles of Bacon and Comenius. The core of the curriculum was to be science. Many examples could be quoted to show how these educational reformers tried to break with the verbal tradition. "Things, things! Too many words!" exclaimed Rousseau. This slogan might have served as the battle cry of men like Francke, who set up in his Paedagogium a botanical garden, a museum of natural history, physical apparatus, chemical and anatomical laboratories, as well as a shop for working glass. Basedow's principal writing, the *Elementary Book*, follows the *Orbis Pictus* quite closely in content. But to give realism to this curriculum he introduced wall pictures into his famous Philanthropium. In the German tradition, Pestalozzi, too, attempted to give practical expression to many ideas which were largely French in origin. The *Encyclopédie* is not in itself an educational treatise; nor are the practical experiments in education of men like D'Alembert, Rousseau, Condorcet and Diderot as important as the theories they advanced. It should be noted, for example, that to his preference for the sciences Diderot added, in his educational theory, the view that few men can read well and that there should be an association between the professor of reading and the professor of drawing. Special attention, he thought, ought to be given to the study of art, itself the copy of nature.

Closely linked with the specific educational theories and practices of these reform movements were philosophical views of great generality: on the whole, the epistemology tended towards empiricism. Moreover, powerfully introduced into Rousseau's advocacy was an insistence, in terms of learning theory, on the need for an education adapted to the natural development of the child. Finally, the absolute need for an educational system in a democracy finds expression in the work of men like Condorcet. These three themes—theory of knowledge, psychology of human development and learning potentialities, and the relationships between education and political organization and control might be used in the further analysis of the impact of new media in our modern world. Out of these themes developed by the eighteenth-century *philosophes* have grown some of the important

national aims of education. The provision of education according to the "age, aptitude and ability" of each individual child is the aim expressed in the English 1944 Education Act. The educational literature of the United States is full of references to the relationships between education and democracy as well as to child-centred education. From the eighteenth century on, democratic educators have been increasingly under some obligation to consider the radical theories of the enlightenment. And, in the twentieth century, new channels of message transmission—the film, gramophone, radio, and television—at last give to teachers a real possibility of achieving the generous aims of that optimistic age.

A point of general interest should be mentioned here, because it has influenced the views generally held regarding the best ways of using mass media. It is often assumed, quite simply, that communication through more than one sense organ is in some sense better than communication through only one. For example, that television is better than sound-radio, sound-film than silent film, and that Aldous Huxley's Smellies and Feelies would be still better. Similarly, it is often believed that, of necessity, moving film is superior to stills; a solid globe to a flat map; a living animal to a stuffed one, and the latter to a drawing. This is no doubt correct with regard to casual observers and more or less passive spectators. Cinema audiences do prefer colour to monochrome and moving sound-film to a show of filmstrip. Zoos draw more visitors than natural history museums, and more people enjoy looking at birds than at anatomical diagrams.

Yet doubts remain. One can always ask whether, in fact, the listener who can see the conductor, the orchestra, the décor, and the rest of the audience does in fact derive more aesthetic enjoyment from the symphony than if he were at home listening to his Hi-Fi and whether Beethoven communicates more richly and exactly to him than if he were blind. In simple face-to-face communication, combinations of sound and visual signs are normally used. Roger Thabault, in his article, illustrates how intonation as well as gesture and context contribute to communication—but they may also interfere. An angry expression on the face of the mathematics teacher, a violent gesture on his part may frighten his pupil and prevent easy communication of the meaning of a theorem. The noise and crash of an engine may get in the way of attempts to understand the inter-relations of its moving parts.

Simply to add further stimuli not relevant to the message being transmitted may seriously interfere with interpretation and understanding. A moving-film of a steam engine is not necessarily improved, as a teaching aid, when the sound of whistles and the clang of

piston rods is added. In a word, while granting, for example, that television is more attractive to audiences than sound-radio, we must not assume that it is always to be preferred in the classroom. And when it is said that a globe is 'better' than a flat map, we can still ask 'better' for what? Would the navigator of an aircraft be well advised to use it? Were Stalin's strategic decisions better because—at least, so it is said—he usually made them with the aid of a globe, eschewing maps?

It is clear that in this area there is ample room for both clear-sighted analysis and far-reaching empirical research. Educators should be prepared in all cases clearly to formulate the aims of teaching which they envisage, and then to consider what channels of communication seem best suited to the attainment of their objectives, remembering that simplicity and directness are preferable to, and more effective than, complexity and involution. Having said that, it should be added that quite evidently direct experience and handling of objects as well as familiarity with the appearance and behaviour of things are necessary pre-conditions to effective learning. In this area, museums and school visits have a role to perform far more important than is usually allotted to them by conventional teachers. Nevertheless, the still picture, the diagram, the map, the words of the teacher are essential, too: they facilitate the process of abstraction which must come before generalization, and thus before the acquisition of mastery over concepts capable of being applied successfully in adjusting to new situations. Sound-radio has not been made obsolete by television; nor the filmstrip by the colour-sound movie. Nor has the teacher in the classroom been made redundant by the studio, the printing shop, or the electronic factory.

These arguments do not imply, of course, that the impact of improvements in communications on the structure and functions of the school has been less than prodigious. Think simply of the results of the greater ease in moving men and goods from place to place—a very basic type of communication. In his brilliant book, *Mon Village*, Roger Thabault describes how the building of a road from his hamlet to a nearby market town, as well as of a railway to more distant parts, was accompanied by a steep and continuing rise in school attendance. Literacy had become functionally useful—it paid dividends and increased the income of the peasants. The latter could now take their produce to potential buyers, and commerce depends upon clerical skill. Turning to other regions—one great cause of 'wastage' in under-developed countries, whether in the mountains of Asia or the jungles of Africa, is the fact that children find it hard and very tiring to walk miles up and down steep paths or along muddy tracks. The provision

of good roads, bicycles, school buses, can do more to increase school attendance than the passing of laws or the drawing up of regulations. After all, the school itself can be profitably considered as one of the links in the general communication network which is the nerve system of a modern society; a link not absolutely unlike the telegraph, the telephone, the railway, the motor-road.

Impact on the Teacher's Work

Let us now turn to examine some of the immediate consequences of these developments on the work of teachers in the classrooms. The revolution in teaching techniques may not be as rapid as the changes in the elegant glass buildings that house television stations and business offices—but it is sure to come, none the less. Even were the scope of the continuously expanding educational enterprise and the consequent scarcity of teachers not to force such a change, the steady mechanization of a technological society would. The question that needs to be raised, therefore, is not whether the technological revolution in education will come or not, but rather whether it will destroy permanently valuable elements in the old regime. We might, perhaps, begin by thinking of the impact of the new media upon the old methods of instruction. In particular, their two cornerstones, the oral and the reading tradition, may be placed side by side to see whether they are likely to be victims or beneficiaries of the coming transformation.

It is often asserted, for example, that the application of mass media to the teaching situation is destined to shatter the lecture method, either as used by the professor in a university or by the primary teacher 'giving a talk' to children. But this is by no means proven. The introduction of the gramophone record and tape recorder has simply expanded and diversified the availability of various lecturers. Even the 'incomplete television', the radio, reproduces and reinforces in the classroom the old method of word-transmission. When used to convey words to a passively listening audience, it is a kind of 'lecture'. The only difference in the case of the radio is that the face of the deliverer of the message recorded or broadcast cannot be watched. Whatever the limitation of such communication, the arrival of television restored the *status quo* by engaging once more the visual as well as the hearing faculties. But with both radio and television direct communication is one way only—from teacher to disciple. If television means no more than the appearance of master teachers before a passive audience, it will hardly revolutionize the lecture method of instruction. A means of immediate and continuous 'feedback' or two-way participation has yet to be evolved.

In any case, the one-sided lecture no longer has a monopoly in any

form of education, not even in the universities. In its place has arisen a variety of combinations of lecture and pupil-responses which still holds a central place in pedagogical instruction. One such combination was the Socratic dialogue, another the famous—or infamous—rote learning; yet another, the modern seminar or class discussion or quiz show. In all these methods, the interaction of pupils and teachers moved to the centre, thus displacing the drama of oral presentation. Here is the cornerstone of all instruction, and it implies not simple one-sided transmission of words but true two-way communication. Here also we have the first recognition that active participation is better learning than passive reception. In requiring the pupils to present the summary of the lesson delivered the teacher exacts attention and enforces response. In presenting the teacher with questions on his lecture the pupils force him towards clarity and increase their own understanding. From these essentially forcible methods there is only one step to spontaneous exchange of ideas, the true essence of all education. Small wonder that oral communication has been and, in some ways, seems increasingly to be the chief method of instruction.

Modern technology does not necessarily augur the decline of this interchange of teaching and learning 'by word of mouth'. If it sometimes appears to do so, this may be due to factors that are temporary in nature. Pictures, discs, radio and television, in their present early stage of development, have increased passive contact with words, but often, incidentally, have also limited the opportunity for active use of words by the listeners and viewers.

We can best illustrate this point by reference to the use of radio in a particular situation. It might, for example, be desirable for cultural, political, or economic reasons to introduce a new subject into the school curriculum and to obtain results as quickly as possible. One instance of such a requirement would be the teaching of a new foreign language not previously studied on any wide scale, say, Russian, in the U.K. or the U.S.A. There are, at present, relatively few people fully qualified to teach it, so that it is not a straightforward matter of recruiting the required number of teachers and making provisions in the time-table of the school. Here mass media can play an important role. Radio is most effective in those realms in which aural-verbal skills predominate and might well be applied. But even an oral approach to teaching languages must relate the 'sounds', that is, spoken words to associated meanings. In the initial stages it would be difficult to do this by use of the foreign language alone. Literal translation from the foreign language to the mother tongue would serve, but questions of methodology arise, about which many people hold strong views. No doubt a better solution would be the publication of suitable

printed matter together with the necessary illustrations. The B.B.C. pamphlets for their German and French courses (at present designed to be used by a teacher) might serve as a useful model. Another possibility is mentioned by Gustaf Ögren. In Sweden, class teachers who are not qualified linguists supervise the follow-up work and preparation given by the radio teacher. It is beyond question that in this area radio could make a major contribution to achieving results on a wide scale in a very short time.

Where transmitters are available to the pupils, direct communication with the radio teacher becomes, of course, possible. One such technique of the School of the Air in Australia, has been recently filmed in Lowell Thomas's *The South Seas*. The radio teacher in a home-based classroom seems to be able to handle both the live class in front of her and a wider listening class sprinkled at hundred-mile intervals throughout the outback. Not only are regular classes held, but an Easter play, complete with costumes, has been filmed with the children participating as radio actors, each from his home.

It is also clear that certain possibilities of cross cultural contacts for school children are suggested by a number of radio programmes which have been broadcast. In 1957, for example, three American university presidents engaged in a transatlantic discussion with three Soviet educators about the aims and problems of their respective educational systems. The programme took place on the Columbia Broadcasting System Network and Radio Moscow. The Americans were represented by Barnaby C. Keeney of Brown University, Gaylord P. Harnwell of the University of Pennsylvania, and Carrol V. Newsom of New York University. On the Russian side appeared Michael Chilikin of the Moscow Institute of Power Engineering, Ivan Petrovsky of Moscow University, and Peter Polukhin of the Moscow Steel Institute. The programme consisted of an unrehearsed discussion between the two teams of educators. The Russian language was used by the team in Moscow, and their own interpreter was translating into and from English. Even with this language complication, and with the doctrinal differences that made educators on each side appear to be wanting to get the better of the argument, this programme assured a mature and relaxed exchange of ideas of an unusually high quality. As the programme moderator, Dwight Cooke, put it, this was another of the 'rare firsts'. It may serve as an important precedent for future use in schools.

Of a somewhat similar nature were the radio broadcasts started by the B.B.C. just after the Second World War. They were called *Trans-Atlantic Quiz*, and during the broadcasts questions were posed to eminent American and British personalities about each other's country.

More recently, the B.B.C. has sent out to its home listeners a weekly programme on current affairs in which there is a simultaneous link up with native commentators in four or five capitals of Europe and U.S.A.

Impact on Language and Literacy

These examples represent modifications of a mainly oral approach, and as such continue an ancient tradition. What our age can be blamed for is the loss of literary language, of the precision of word and phrase as the ancients or the Victorians knew it. In part, this may be connected with the decline of reading among the literate classes. It is the linguistic finesse, the sense of awe before the majesty of words, derived from intense exposure to reading, that is receding. Furthermore, the advance of the formerly non-literate classes, with their initial indifference or even contempt for a word-centred culture, reinforces the prevailing feeling of lack of obligation to observe educated rules of language use or appreciate precision.

Still, the barbarism of to-day may not last long. For truly living languages, current use is the guiding criterion of the literary forms to come. Ours is a future-oriented age, and in such periods the demand for freedom of experimentation always outweighs the anxiety to preserve undiminished the worship of the past. In language use, as in many other areas, we are in a state of flux—which does not justify the pessimistic feeling that ferment must be decay. The exposure to words to which the mass media have committed all of us may result in a saturation which will translate itself into experimentation in use of words. Passive literacy will then be replaced by active literacy.

There are bright prospects of a living vigorous language arising out of the period of adjustment in which easy reliance on television sets and tapes seems to have caused school work to be sometimes less careful and attention to modes of speech half-hearted. The media carry within themselves the means for their own self-improvement. The switch from easy, pre-adjusted material that can be absorbed on contact to challenging two-way communication that poses problems instead of solving them is perhaps around the corner. Then the unbalance in oral learning caused by new technological devices would correct itself.

The teaching of reading and writing was, and still is, the most immediate obligation of the schools; lack of success here could be considered an index of a total failure to supply the basis upon which the acquisition of learning rests. Small wonder that the fulfilment of such function has for long been safeguarded by teachers through insistence on selectivity, through the reservation of schools for pupils chosen for ability or motivated by parents, or careers towards high degree of

literacy. But the great plurality, the variety of tastes and talents in new universal education made a veritable last bastion out of the endeavour to abide by these obligations. Hence an increasing resort to mass media in the hope that mechanical devices will smooth the troublesome passage.

It is not always clear, however, whether mass media are sought to help with reading and writing or to avoid this onerous duty. In the United States, the first large-scale practitioner of mass culture and the largest market for mass media, such problems are particularly acute. Books and articles from "Why Johnny can't read" to "Why Jeanne can read" seek now to dramatize the American failures and to contrast them with European achievements. The Soviet mass education project, after teaching reading and writing by mass adult literacy campaigns in the first phase of its existence, now seeks enforcement of school teaching of these subjects through strict discipline, drill, and repetition. Rigorous application and steady pressure have also been crowned by significant success in teaching reading and writing in many elementary schools in other countries.

On the other hand, failure to pay the price of discipline and 'aversional learning' has led to charges of incompetence and dilettantism against the teaching profession in many lands. In fact, more and more often hard-pressed educators seem to the public to be deliberately downgrading their traditional literary programmes. A celebrated statement by an American junior high school principal has been pilloried both by Arthur Bestor and Hyman Rickover:

Through the years we've built a sort of halo around reading, writing and arithmetic. . . The Three R's for All Children and All Children for the Three R's! That was it. We've made some progress in getting rid of that slogan. But every now and then some mother with a Phi Beta Kappa award or some employer who has hired a girl who can't spell stirs up a fuss about the school . . . and the ground is lost. . . . When we come to the realization that not every child has to read, figure, write, and spell . . . that many of them either cannot or will not master these chores . . . then we shall be on the road to improving the junior high curriculum. Between this day and that a lot of selling must take place. But it's coming. We shall some day accept the thought that it is just as illogical to assume that every boy must be able to read as it is that each one must be able to perform on a violin, that it is no more reasonable to require that each girl shall spell well than it is that each one shall bake a good cherry pie. . . .

When adults finally realize that fact, everyone will be happier . . . and schools will be nicer places in which to live.⁵

In defence of the high school principal one must say that even such extreme 'neanderthal' views may have been prompted by genuine con-

⁵ Quoted by David Riesman, "Thoughts on Teachers and Schools", in *Anchor Review*, No. 1, 1955, pp. 43-4.

cern for real school learning, however ill-conceived. One recalls the distinguished American educator with vast experience in undeveloped areas who kept referring to the written alphabet as 'those d . . . black marks' to which children all over the world are forced to devote the major portion of their youth, to the exclusion of more generally useful studies along the lines of their interests. Such educators believe that a broad spread of learning and real all-roundedness can be best achieved through means which are not exclusively verbal. Attitudes of this kind, whether they be bold and forward-looking prophecies, or anti-intellectual blasphemies, are apt to aim at deriving help, efficiency and comfort from the expanding technological media. They profess a somewhat justified helplessness in the face of the American polls, which reveal that the overwhelming majority of youth prefer to see a topic on television instead of reading about it. The gruesome spread of comic books and cartoons carries its own telling lesson.

But mass media cannot be adjudged a one-sided liability where reading and writing is concerned. Very often, directly or indirectly, they are used to enhance instead of superseding academic studies. Thus, in 1957, a professor of physics at the University of California was teaching his subject to some 800 high school pupils over the local television station. A year later his course, put on film, was reaching some 80,000 school children in fifteen states. Each of the students of this and other similar reputable educational programmes has been reported to read not less and often more than before. No doubt to come into contact with an unusually proficient master teacher is very stimulating. Altogether the impact of television upon the thinking and the culture of the American public has recently been called, and with justice, 'immeasurable'. Even in negative terms television may enhance literacy if we are to believe Malcolm Muggeridge in a recent address before the International Press Institute :

There is so much television cannot do and so much that the printed word can and will be able to do. With all its terrific impact, television is little listened to. During the time that I used to appear on it fairly regularly, I never had one single instance of anyone recalling a thing I had *said*. Television by its nature has to move on; there are no pauses as there are in reading. It can show the news and show people; it can mount useless discussions and interviews; but it cannot explain or expound.

Thus it might be that the television cult will rescue journalism from the triviality and sensationalism which have so corrupted it in recent years. It might force journalism to return to an earlier and better tradition by, as it were, siphoning off the excrescences, the cheese-cake, the gossips, the melodramatic overplaying of news stories, simply because of the unhappy chance that, in this field, television is unbeatable.⁶

⁶ Quoted in *Encounter*, December, 1959, p. 16.

From all this it seems to follow that the adverse impact of the new media upon good habits of reading and writing, so often complained of, is by no means a foregone conclusion. Indeed, visualization may help to develop them.

One celebrated project, far-reaching in its effect, illustrates this. It was launched by Frank C. Laubach, under the 'Each One Teach One' motto. This project was originally launched in the Philippines and consisted in combining teaching of letters with pictorial illustrations. Each consonant and vowel and, later on, whole words were superimposed upon pictures representing the subject or beginning with the relevant letter. Drill and repetition established the desired association between symbol and object. The original pictures were for use with the Maranaw language in the Philippines. Subsequently, some two hundred and fifty languages in some one hundred countries were covered by the Laubach movement. A short perusal of the available sources such as, for instance, of the UNESCO periodical, *Fundamental and Adult Education*, indicates the widespread current use of the combinations of printed word and illustrations for the purpose of teaching literacy, both in original Laubach form or in recent variations or developments.

Another example of fusion of the old art of reading and the new technology is the 'teaching machine'. Of course, from one point of view, the school textbook is itself a 'learning machine', and it certainly still has many unused and unexplored potentialities. But the words are normally used to describe devices of a different kind. Beginning with the 'twenties, attempts were made to regularize learning to the point at which instruction could be administered by a mechanical device. In the United States these attempts have recently received impetus from the double impact of expanding school population and scarcity of teachers. Psychological researchers at Harvard University have supplied the movement with an appropriate theory of learning and have worked on the perfection of the mechanism of the machine. A conference of interested people at the University of Pennsylvania in 1958 resulted in the publication of a book on the subject.⁷ Recently a commercial company, Skil Guide Inc., has been formed in New York to prepare and market such teaching machines.

A company circular describes how one type should be used by the student, and how the questions are asked and the correct answers revealed without the student being able to change his own. When the student has marked his answer right or wrong he can proceed to the next frame in the sequence of between thirty-five and a hundred filmed

⁷ E. Galanter, ed., *Automatic Teaching* (Wiley, New York, 1959).

items. A 'review' mechanism enables him to reconsider only those questions he answered incorrectly. Since the sequences are so constructed that the answer in each frame is based on material learned through prior frames, it is essential that the student should know immediately whether or not any one of his answers is wrong. Scores and time required to complete the sequence of questions are mechanically tabulated for the use either of student or teacher. The whole presentation and the grading is therefore entirely mechanical.

Assuming that machines can be provided for all pupils, a not inconsiderable logistic undertaking, the machines may well fulfil the promise of their sponsors by freeing teachers from a good deal of routine and by gearing the work of pupils to their individual pace. There is no doubt that such machines could facilitate the necessary drill in reading and writing, since the whole operation is based on these activities. With an almost inevitable shortage of teachers, such media may, in fact, safeguard rather than harm the traditionally cherished ideals of education.

The future use of the mass media in schools seems thus to present exciting possibilities rather than to presage disaster. We may be at the threshold of events likely to mobilize not only the eye and ear but also smell, touch, and perhaps even taste in the service of education. At least, such seems to be the somewhat humorous lesson of a project on the Middle East observed in a New York elementary school during which children sat swaddled in burnus-like sheets munching fried locust provided for the purpose. Such is also the heady if insufferably oleiferous promise of the first 'Aromarama' which recently brought the smells as well as filmed pictures of China, *Behind the Great Wall*, to the New York public!

That such developments would result in more erudite and many-sided men may be true—the question, however, is whether they would produce better educated men. To achieve this result, the media must expand horizons rather than simply make learning easier and more comfortable. Hard work need not, of course, mean better work; but to say this does not alter the fact that easy work carries no guarantee of better work either. What educators must plead for, standing as they do on the threshold of the new methods in the classroom, is that they should contribute to drive, dedication, and energy in the pursuit of learning instead of fostering chaos, dissipation of effort, and glossy promises of easy short-cuts to intellectual success.

Textbooks

In spite of the impact of new, twentieth-century inventions on the functions and activities of the school, the textbook—that ancient



learning machine—remains the chief aid used by classroom teachers apart, perhaps, from the blackboard. Its influence in determining what is taught as well as in shaping methods of teaching remains prodigious—it is as strong now in most countries as it was a hundred or two hundred years ago. Of course, the textbooks of the 1960's are different in presentation from those common a few generations ago. The text is better adapted to the reading skill of young pupils, the sequence of topics is arranged with more regard to sound pedagogical principles, the type face used is more legible. Above all, there are more pictures, including both line drawings and photographs, and these pictures are often coloured. The whole presentation is more lively and attractive—but this does not necessarily mean that the new texts are more effective teaching tools. Indeed, it might well be argued that the illustrations are, in fact, less informative than those used a hundred years ago. All too often the rather crude photographs included in many texts are so confused and overloaded with detail that a child finds it almost impossible to see what he is supposed to observe. The commercial success of pictorial magazines and newspapers, which rely largely upon photographs, has undoubtedly misled many authors and publishers. They have failed to distinguish between “superficial attractiveness to casual readers” and “presentation of selected information to learners”. A glance at a text of the 1860's, or for that matter at the great French *Encyclopédie*, will soon convince most people that the history of visual education during the last hundred years is not one of steady and continuing advance; on the contrary, in many areas there has been retrogression. Of course, the cost of publishing photographs is usually lower than that of producing and printing line drawings—but let no one think that the latter are either less informative or less attractive than the former. The success of the strip cartoon demonstrates this point admirably.

The improvements—very real in spite of these critical remarks—in the production of textbooks during the last thirty years are in large measure the result of the adoption by publishing houses of production methods of a standardized, industrialized, scientific kind. Formerly an author, either a noted scholar or a very experienced teacher, wrote a book—usually in his spare time—which embodied his own craftsman experience of teaching a particular subject. He then took the manuscript to a publisher, who improved and amended the text slightly. An artist, paid by the publisher, copied the author's diagrams in a professional manner. The somewhat revised manuscript, together with the diagrams, was sent off to the printing house, where craftsmen set the whole thing to the best of their ability. Between two and six—sometimes ten—thousand copies were printed. If the book was a great

success further editions were produced in subsequent years—now and again there might be twenty or thirty of them in the case of a 'best-seller'. All this can be characterized as a small-time or craftsman-dominated industry.

To an ever-increasing extent these methods are being replaced by industrial team production. The publisher becomes an entrepreneur. Basing himself upon reports furnished by his agents or travellers, he and his colleagues decide that a text is needed to cover subject X at level Y. Enquiries and research show that the topics to be covered, if the needs and prejudices of potential buyers are to be met, are *a, b, c, d*, etc. Subject-matter experts in university or college are asked to give advice. An author is engaged and research staff put at his disposal. Illustrators—artists, draughtsmen, visualizers—work together with him. A preliminary text is prepared and often tried out in school. Full-scale revision is then undertaken, and ultimately 'the book' goes to press, a minimum of 50,000 or 100,000 copies being printed. The 'author's' position is analogous to that of the star in a movie-film.

Needless to say, the above does not refer to every school textbook now being produced. It describes a trend in a slightly, but only slightly, exaggerated manner in order to make clear several important points.

First, this particular technique fits in admirably with present technological trends. New processes and machines have been invented and will be in full production very soon. They represent the application of industrial organization and scientific technology to printing. Even now one sees chiefly old-craftsman methods in operation in printing houses, modified only by minor chemical and physical improvements: nitric acid is used for cutting lines instead of the slow and laborious knife of the artist. But entirely new processes, dependent upon recent developments in electronics and photochemistry, are coming into use and they will replace these hand methods. In the near future it will be possible to print in, say, seven rich colours on almost any quality of paper in one operation—and no particular degree of skill or taste will be needed among the workers controlling any stage of the process. There is only one snag: the cost of setting up the machines is so high that it is not worth while printing fewer than 100,000, or even 250,000, sheets in one operation. In other words—it will be possible to produce school textbooks of high quality, as rich in colour reproduction as any present-day magazine in the United States, and to sell them at a price not much higher than that charged for these magazines. The heavy cost of careful editing will be swallowed up, as with these magazines, in the large quantity sold. Note, however, the appalling difficulty of producing school textbooks of which the first edition must number 100,000 or 200,000 copies! How many publishers would dare to face

such a risk? Yet who can doubt that books produced in this way and printed in many colours can prove to be exceedingly useful teaching tools?

Two possibilities exist, each of which might meet this situation. First, international co-operation between publishing houses, making possible the production of textbooks for a market much larger than any one nation can provide. This is, of course, happening on an ever-increasing scale, especially with books which are not properly 'class-room texts' but of a general interest, information, extra-curricular kind. When one compares the quality and attractiveness of these with that of the usual class book, one begins to realize the size of the gap between the actual and the potential. Of course, a good teacher using a poor quality, old-fashioned text will teach his pupils more than a bad teacher using an excellent text—but this does not affect the argument.

Secondly, it seems possible at first sight that government—or at least some semi-official public textbook corporation—could regulate the production of textbooks and the prescribed use of these throughout a national system. This would make possible the production of textbooks embodying all the best printing techniques now available because the capital cost could be borne by all through the device of selecting only one text for all the schools of the country. As everyone knows, this happens in all Communist countries. As regards writing the text, various systems are in use. Sometimes a well-known scholar or educationist is commissioned to write a book, say, for the mathematical courses in the seventh year. In due time the book appears, is printed in vast editions and distributed all over the country. The author is given royalties, usually of the order of 10 per cent on the first 50,000 copies, thereafter diminishing quickly. Or else a committee of writers is put to work to produce a good text, on the basis of the best books previously produced at home and abroad. In either case the written parts of the text are clear, straightforward, up-to-date in outlook, sometimes fresh and original. The quality of the production, from the point of view of modern printing and publishing techniques, however, leaves much to be desired. It is no exaggeration to say that the school textbooks now available in the schools of the U.S.S.R., let alone China, would have seemed poor in quality and of old-fashioned appearance in Western European and American elementary schools fifty years ago. In other words—state production of textbooks does not automatically guarantee good technical quality nor even full use of present-day printing techniques. Careful examination of the content and presentation of material in Soviet textbooks confirms this impression: the material itself is good and modern but, judged by good pedagogical

standards, the order of presentation as well as the pedagogical outlook is extremely old fashioned. The authors evidently envisage a style of teaching which is purely didactic, formal, passive, teacher-centred—the sort of thing found one or two generations ago in Western European secondary schools.

In the non-Communist parts of the world, production of school texts by governments or other public authorities is rarely found. There are interesting exceptions: in Peru, for example, a few years ago no publisher had been found able or willing to produce reading books in Quechua for the Indian schools of the Andes. In consequence, inspectors, with the support of the Ministry of Education, themselves wrote texts, and these were duplicated (mimeographed) and distributed. In New Zealand, there has been quite a good deal of official textbook production. Examples of this kind are, however, unusual outside Communist states. There is, nevertheless, a fairly widespread and continuing belief that official production of texts for schools might be wise and that it could help some of the newly independent countries which are now endeavouring rapidly to establish mass systems of education—for instance, Burma, Thailand, Nigeria, Ghana, Congo, Indonesia. The arguments supporting this attitude deserve analysis—some have already been listed and examined in UNESCO monographs, such as *Provision of Popular Reading Materials* and *Primary School Textbooks—Preparation, Selection and Use*.

The first argument, used by those who favour nationalized production and prescription of textbooks, is an economic one. They urge that a monopoly vested in the state would save the taxpayers' money. Yet the only saving, apart from the possible non-payment or under-payment of the authors, would be that of the publisher's profit—a marginal cost easily offset by the ability of the publisher to market his product in a wider area than one single under-developed state. Even the supposed saving obtained through the avoidance of author's royalties may be fictitious; the true cost may be camouflaged by accounting methods because a government department has used its staff without charging up the cost to the books produced.

The possible advantage of a government being supposedly better able than a private publisher to enlist the services of able and scholarly authors has already been dealt with. But in fact, why should a government official—or, for that matter, a committee—be wiser in its choice of authors than a publisher whose own livelihood is involved in the decision he takes? Do modern officials and governments have a monopoly of wisdom? Are amateurs better in this field than professionals?

Are we to accept another justification sometimes urged—that

government prescription of texts would ensure that the best and most up-to-date books would be used in schools? Is it likely that there would be officials in the Ministries perfectly familiar with modern printing and publishing techniques? And if special publishing departments have to be set up, where would be the saving in comparison with private publishing houses? Furthermore, it takes the best part of three years to produce a series of school books. Allowing a minimum of another three years of use before scrapping, this would mean that a period of six years at least would elapse between the inception and the scrapping of a new series by a government department. Add to this 'x' years to represent the inertia which seems natural to any official body. On the other hand, there is no difficulty in refusing to adopt nor in scrapping any series of books produced by private enterprise; officials are usually far from being deeply upset by the thought of causing pecuniary loss to entrepreneurs. Furthermore, the private publisher operates under intense competition, both as regards content and sale price of his books. The buyer—in this case the official school system—benefits from the efficiency which is the result of genuine competition. The general conclusion of all this seems clear. Production of school textbooks by independent publishers yields books which tend to be more up-to-date, more attractive in appearance, and probably less expensive than books published by government agencies. A comparison of the textbooks published in Communist and non-Communist countries confirms this conclusion.⁸

But the most powerful arguments against government production of school textbooks are those which have to do with diversity and with freedom—freedom of the teacher and freedom of expression. Official production of printed matter—or, of course, of cinema, radio and television—necessarily implies censorship and suppression of whatever views the government does not like together with promotion of what it does like. The very creation of a machine for nationalized publishing is in itself undesirable—even in the most liberal states there is a tendency for government and administration continually to extend the sphere of its powers. From another point of view—surely those entrusted with the teaching of young citizens are capable of choosing whatever books they prefer to use? Teachers vary in their methods according to their own temperament as well as according to local circumstances. The wider the choice of textbooks from which they can choose, the more likely they are to find one which exactly suits

⁸ It is often thought that Russian textbooks are inexpensive. When judging their price, note should be taken first of the official and tourist rates of exchange, next of the rate of wages and salaries, and next, of possible subsidization. Taking these factors into account, the books are by no means cheap.

them; and government publishing could provide as wide a choice as independent publishing does, only at a cost at least as high as the latter.

Certain exceptions should be noted. In some under-developed countries it may well be that—because teachers are not well trained—some form of prescription is necessary and even—as in the Peruvian case—some form of official production. So, too, under conditions like those which exist in New Zealand might government publishing be valuable. Yet, even then there should *not* be a prescription of only one book per subject. Such restriction paves the way to bribery or corruption. In addition, it discourages teachers from thinking for themselves. The list of 'prescribed books', in other words, should always offer as many alternatives as possible.

A policy of this kind would, in any case, be a wise one in every low-income country. The development of adult literacy in those areas is dependent upon all forms of literature, distributed through a network of bookshops. In the early stages of development the only way such bookshops can exist—apart from Communist countries which establish government stores for the distribution of propaganda material—is by the sale of educational books. Without such sale there would be no bookshops and, therefore, no books for public purchase.

The general conclusions are quite clear. Government production of textbooks would be justifiable in countries with a liberal tradition and a free economy only if it could be shown that it ensured: (a) economy of production and distribution; (b) better and more modern books; (c) a wide choice of books so that experimentation in school would be encouraged; (d) rapid changes in books, so as to keep constantly up to date. It may be that, in theory, all these criteria might be met—if only government officials were always very wise, very bold, very generous and far-sighted. In fact, however, government production is likely to turn out hackneyed, old-fashioned, formal, badly printed books. Exceptions to this are rare. In Communist countries, naturally enough, all textbooks are and will be produced under the sponsorship of the state authorities and prescribed for use in school. Given the forms of ownership, production, and distribution this is unavoidable. A good result will be that books are made available even in the poorest parts of the Soviet Union and China. The disadvantages, however, are so obvious that there is no temptation to follow an example unattractive when judged by the quality of its production. The success of Russian education comes from the tremendously hard work of the pupils and the excellent quality and devotion of the teaching staff—it is a success earned in spite of, and not because of, the kind of textbook used.

The Organization of New Media Services

Many of the issues connected with the publication of textbooks arise in one form or another in the production of educational programmes in the new media. It is apparent, for example, that certain problems exist where radio, TV and film services have still to be developed. Where schools are not yet even partially equipped to exploit the educational advantages of the new media and where broadcasting and film facilities are limited or non-existent a vital point must be decided. Should mass media services be allowed to grow under the stimulus of private enterprise? And as a corollary: Can commercial interests be relied upon to judge what programmes are suitable for use in schools? As opposed to this viewpoint should governments—either at the local or national level—take major responsibility for the production and dissemination of programmes for use in the schools through the mass media?

Doubtless no set policy will serve the needs of all countries. Yet the problem is acute. Certainly the potential of new media to remove illiteracy is tremendous, but before any of it can be realized several economic considerations should be noted. There is first of all the problem of capital investment. Before radio can be used at all, transmitting stations and broadcasting facilities have to be built and receiving sets provided in large numbers. Similarly in the case of films, production units have to be formed and projectors made, distributed and serviced. However, the economic return on the necessary capital investment for educational purposes is neither very obvious nor immediate. Moreover, the social consequences of such investment are themselves rather obscure. Risk capital is, in a sense, needed. Commercial enterprise might be very reluctant to invest money in the development of mass media services unless there is some guarantee of substantial returns. These can obviously be most easily ensured through entertainment or by sponsorship of programmes preceded or followed by advertising. Unfortunately, mass media tend to appeal at two levels to somewhat different audiences. The masses are entertained, but educational offerings tend to appeal to a limited audience. It is quite possible, of course, that restraints similar to those which exist among publishers might develop in the area of mass media production, but some of the possible dangers of heavy commercial investment in film and TV productions are revealed in the article by Professor Hiratsuka and Professor Iwahachi on Japan.

Once adequate production techniques have been established for new media there remains the task of ensuring an efficient distribution of programmes and other available material. To equip every school with

a radio, a TV set and a film projector is a formidable undertaking. Moreover, under pressure from the entertainment world technical improvements occur frequently. Up-to-date replacements are expensive and increasingly complicated. They are consequently expensive to maintain in good order and difficult to use, particularly by those who are not technically minded. A silent film is, from a technical viewpoint, easier to produce and to project than one with a sound track. It is true, however, that modern developments are often in the direction of reducing technical presentation problems. It should not, of course, be assumed that the latest equipment necessarily ensures the most effective teaching. When funds are scarce the purchase of less advanced equipment, more easily operated by non-technical teachers, might be sound policy.

In addition to this issue there is also the question of providing facilities which will make it possible for teachers to be selective in their use of visual material. Films and filmstrips are, of course, more or less permanent visual aids, improvements in sound recordings have made it possible to give permanence to radio and TV programmes. Hence it is now possible to maintain in libraries collections of films, filmstrips, tape, and disc recordings. Some examples of how these facilities are developing are provided by various contributors. In every case, however, an important principle to remember is that libraries make it possible for the teacher himself to select and use visual or sound recordings as and when he thinks fit.

Perhaps at the moment new media programmes too often dictate what is done in the classroom and because of the absence of direct and immediate feed back from pupil to teacher some educative elements are lost. Only when the teacher can introduce into a lesson information drawn from a variety of sources in the form of excerpts from films, radio, and TV programmes, etc., will he be able fully to take advantage of the new media. Adequate library facilities and many single purpose films—produced with careful attention to such details as length, subject-matter, presentation and pedagogical significance—would greatly strengthen the teacher's position.

One further point should, however, be considered. At the moment the teacher has to accept for classroom use programmes produced by other people. Doubtless many producers in the new media enlist the help of teachers and other specialists. But committee action does not necessarily result in the most educative and aesthetically pleasing programmes since many interests have to be reconciled. The question of control is also crucial because, whatever qualities new media possess as transmitters of information and knowledge, there can be no doubt of

their effectiveness in evoking emotional responses and hence in building up attitudes, beliefs, and prejudices. Frequently the manner of presentation, rather than the data supplied, determines the attitudes inculcated. To-day the vital issue of attitude formation has been raised to the international level.

Many governments seem less inclined to allow to new media producers the same degree of freedom permitted traditionally to book publishers. Some monopoly in the field has to be weighed carefully against the consequences of allowing private enterprise freely to promote mass media programmes and particularly those which might well be used in the schools. There are, in all this, important socio-political issues which can hardly be answered categorically without careful consideration of local circumstances.

New Media and Democracy

The roads of the Roman Empire helped to unify and harmonize the actions and thoughts of men living far from one another: they represent the embryonic nervous system of a primitive state. Telegraph and telephone, radio and television, jet engine and rocket are so much swifter and more pervasive in their effects that they create situations altogether different from any envisaged before. The political thinkers of Greece felt that a community of free citizens could not organize a state numbering more than a few thousands meeting face-to-face; but now a World State could be established to regulate, on a humane and democratic basis, the political and social affairs of the whole of mankind. The communication network has become a complex nervous system sufficient to integrate a vast organism. The antithesis, however, threatens: the instruments of unification can be turned to purposes of destruction and disintegration.

Mass media are easily harnessed to the ends of autocrats and demagogues. The raucous eloquence of a Hitler and the passionate vulgarity of a Goebbels were not employed to present constructive ideas or reasoned arguments to millions, but rather to shout slogans calculated to promote obedience or to rouse mob violence. Yet even in the older democracies and with well-meaning, mild political leaders, the force of Walter Lippmann's argument, strikingly made decades ago in *The Public Philosophy*, is apparent: the veto power either of a mob or an electorate is immense; the ability to formulate realistic policies is woefully limited. In the absence of inner moral restraints mob rule might prevail even in countries like Britain or the U.S.A. Large audiences, consisting of millions of small groups of two or three persons munching or smoking in their sitting-rooms, can see and hear the politicians

on an hypnotically flickering screen. The viewers respond to 'personality' rather than to arguments. Thus even the most democratically inclined statesmen are tempted—even forced—to use the evocative power of sound, gesture, image, not only all the arts of the actor, but also demagoguery to win mass support. The ideal of reasoned participation in policy making may, as time goes on, be dangerously undermined even by those who would wish to defend this democratic principle.

Yet another characteristic of new media militates against the exercise of wise and deliberate judgment. Mass reactions are now quicker. To commit words to print involves thought and takes time and, in any case, written messages are transmitted rather slowly. All this creates conditions under which balanced reflection is possible. But to-day the casual conversations of statesmen and diplomats are flashed round the world. The reactions to all political statements, either from within the country of origin or from the rest of the world, are often so immediate as to suggest they are non-rational or at least made from pre-formed positions.

Evidently the technical problems of keeping the public informed have been overcome. The problems which remain are socio-political and educational. At one level there is the question of controlling the media of communication; at another there is the question of the responsible use of them as instruments of national and international political education. Again, there is the tremendous and unsolved educational task of preparing electors to exercise critical judgment on political issues.

Nor is the question of multiple choice restricted to political activities. Films, and radio and television broadcasts are agencies of aesthetic and moral education. Film-star fashions, for example, are widely copied; the glorified gangster might become a hero type for adolescents and adults. In short, a continuous stream of attitude-forming information is beamed at vast audiences under the label of entertainment. The leisure time of people is increasingly taken up with these forms of diversion, so that by comparison the attitude-forming power of family, church, and school declines. The cult of the radio or television personality is a force which must be taken into account when assessing the relative weight of educational influences. Any well-known quiz-master has only to express himself rather forcibly on capital punishment or on the quality of hotel beds to receive immediate and respectful attention. This is the world of 'admass' and of the 'waist-high culture'.

Faced with this kind of pressure the responsibility of the teacher becomes very great. Matched against the glib facility of a radio com-

mentator supported by all the gimmicks and aids to presentation, the classroom teacher is gravely hampered in an age in which the titillation of the public fancy has become a matter of professional expertise. His influence on adolescent minds has to be weighed against that of ephemeral stars of film or TV screen. The easy success of popular entertainers is in great contrast to the sustained effort needed to achieve anything worthwhile in other spheres—and especially in the school.

Faced with this kind of competition, teachers can make one of several choices. They can, of course, ignore the challenge, or, what amounts to the same thing, simply denigrate new media. Or they can attempt to turn the situation to good account by competing with entertainers for the attention of the masses. Why not an educational TV personality? Research in the United States indicates that the choice of a teacher whom students regard as a 'good one' is far more important to them than the methods of presentation employed—either TV or conventional. Several of our contributors comment upon the need for educational films (and doubtless TV scripts) which are as technically well-made and perhaps as exciting as commercial productions. This would involve providing money for education as generously as for idle entertainment—which not only those in charge of film or television studios but even administrators find it hard to envisage. One is continually reminded of the fact that public education started as a public charity made available to the humble and poor—and the smell of the poorhouse seems to cling obstinately around the whole of educational finance. However, the fact that education can be made exciting when money is available has been amply demonstrated. One remembers not only a number of B.B.C. broadcasts but the documentary films made under the inspired leadership of men like Paul Rotha and John Grierson—films which entertained large audiences while instructing them.

The active use by teachers of media which, for good or ill, have become powerfully educative is part of the answer to the challenge they face. Unless educators take the threat to their value systems seriously and learn to use modern methods effectively, their influence will decline as surely as has that of the priesthood. Formerly, their function rested upon the ability to teach people the difficult art of reading—in the full sense of that term and not just the translation of visual symbols into sounds empty of meaning. Other agencies now compete to unlock the doors to knowledge. With their books and blackboards, teachers now face politicians, industrial tycoons, and business men backed by their films, radio, television, and illustrated magazines. They must counter with similar means.

In general, the position of a teacher as mediator between child and society, the past and the future generations, remains as before. He attempts to enlarge the experiences of his pupils directly or vicariously. He was long regarded as the source of information *par excellence*. More recently he has come to be regarded also as one who should promote the full development of the young people under his care, not only in the intellectual and cognitive but also in the moral, aesthetic, emotional, and physical spheres. Until recently he relied chiefly upon talk and chalk. Now a host of audio-visual aids are at his disposal. Their power to evoke effective as well as intellectual responses has been stressed. The teacher's task has not been made easier, but he has more things to help him than ever before—if he knows how to use them.

Instead of one language having to be taught there are several. Visualization takes many forms and the symbolism of the film, the filmstrip, and the wall chart are different. A language appropriate to each may have to be learned and, furthermore, different visual languages are being created—some of them by very hit-and-miss methods. Although teachers are expected to be able to read from a printed page, less thought is given to the need to train them to read or to use visual symbols. Much of the sign-language of science, for example, remains a mystery to many teachers. We have argued already that visualization enables knowledge to be spread more widely and that, in principle, it is universal—an affair of all mankind, not of a select few. The new languages are easy, but they must be learned.

Deeper questions remain. What final aims and objectives should educators cherish and pursue? What should be their attitudes towards other social groups, other nations? It is chiefly through mass media that the larger community to-day is exposed to the influence and impact of the attitudes, tastes, and value-systems accepted by smaller groups, whether of aristocrats or gangsters. In free and open society no single group, nor even a small number of groups, entirely monopolizes all the new media. What does happen is that innumerable and often conflicting choices are offered to the public. Hence importance must now be attached to developing and fortifying the power of intelligent discrimination; and this immediately raises a host of philosophical questions having to do with criteria of judgment and with the nature of knowledge.

More urgently than ever arises the question of the limits of the responsibility of the teacher, as educator, not as propagandist. Propaganda differs from education because it attempts to mould and fashion individuals, without paying respect to their reason and individuality, seeing them only as tools to be shaped. Yet—here is the antinomy—

an element of propaganda remains even in the best kind of teaching, even of science. There is bound to be selection and organization of material; thereby some courses of action are facilitated, others hampered, some wishes and urges fostered, others weakened, and all this without the learners being made fully aware of what is happening. The new media can be turned into powerful agencies of propaganda by teachers just as easily as by politicians. If the material selected and the form of presentation harden the feelings carried over from childhood, if they sustain ancient prejudices and maintain dependence, the result will be to make more difficult the adaptation of the adults of to-morrow to the world of to-morrow. The evils of the past will persist into the future. There is much knowledge available which it is urgent to impart: but men will not listen if their ears are tuned to other notes. Could not obsolete feelings and outworn prejudices be changed through the skilful use of the new media? Could not good propaganda be used to drive out bad propaganda? Or is all propaganda bad? If an educator is sincerely convinced of the truth and rightness of the views he holds, is he justified in using his own conscience as the touchstone needed to assess such issues? Is there a professional ethic, a tradition, a code of honour capable of regulating the actions of teachers everywhere?

A teacher cannot run away from his responsibility as mediator, nor should he try to. He must himself discriminate and choose before he can help his pupils to form their own judgments. There is an imperative need to awaken in the minds of the young a lively and explicit awareness of the brotherhood of man, of the bonds that unite man to his fellows. Narrow sectional exclusive loyalties have become dangerously obsolete. Close and intransigent identification with particular racial, national, or cultural groups is now suicidal, genocidal. Only on a generous, human, universal foundation of goodwill broad enough to embrace the whole species could one build securely the political structures which would ensure peace between nations and thus promote spiritual and material well-being. Modern communications make it possible now to establish the One World: what is lacking is the right climate of feeling. Here teachers can help—indeed, their contribution is vital.

New media can serve either to enlarge the sense of community or to atomize social groups. Nationalism or world-mindedness can be promoted; warlike or peaceful feelings encouraged; racialism or man's common humanity taught; tolerance or intolerance preached. Bacteriological and nuclear weapons make the prospects for mankind's future sombre and horrifying if the narrow, the particularist, the provincial, the aggressive attitudes are built up in the coming generations. The choice is stark and ineluctable: unification or annihilation. Fear

may prevent catastrophe, but it can be no more than a temporary safeguard.

Parenthetically we might mention how important new media have become in the matters of taste and fashion. Previously members of a social élite were the guardians of taste and fashion. As patrons of the arts they set standards in manners, dress, and food habits which by emulation and imitation tended to become widely accepted. New media by-pass this selective filter and appeal directly to the mass of people who with few opportunities to establish their own criteria of judgment can only accept or reject what is offered to them. The mechanics of control of taste forming media are important and one has to ask seriously how standards can be established, and individuals helped to discriminate wisely.

There is an obvious danger that through advertising campaigns, and indeed through almost any mass media presentation, standards might be debased. This suggestion arises from two considerations. In the first place the ability to discriminate is probably difficult to acquire and has almost certainly to be learned. Secondly, those who control mass media presentations might not be interested at all in the maintenance of standards, but only in the sale of certain products. In this respect the relative merits of commercial control and that of an organization like the B.B.C. should be carefully weighed. In any case the viewers *en masse* are going to be the final arbiters of taste simply by the process of rejecting or accepting what they are offered through the new media. The teachers' role is one of inculcating powers of appreciation and discrimination in this, as in other, fields. This contention implies that lessons in TV, radio, and film appreciation (and also consumer discrimination) are as important to-day as the study of the great literature of the past.

Teachers and educators to-day have at hand tools more powerful than had their predecessors. They could create, if they tried courageously, tenaciously and intelligently, the necessary climate of thought and feeling, for now not only do the children of the rich and powerful go to school but, as Comenius hoped, "all alike, boys and girls, noble and ignoble, rich and poor, in cities and towns, villages and hamlets". To try to establish among all members of the republic of children the attitudes which will help them, when they are grown men and women, to maintain peace and extend human freedoms is the duty and privilege of teachers. Their individual contribution may be humble and modest, but yet essential. At this time none of us should dare to do less than our best.

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NEW MEDIA AND EDUCATION— THEORETICAL AND SOCIAL IMPLICATIONS

DEVELOPMENTS in media of communication depend in part upon existing levels of technology. Picture languages, hieroglyphics, mathematical symbols, and alphabets were devised to meet certain problems of communication. Methods of recording them depended upon the materials and tools available. Each new technique, however, initiated certain processes of social evolution. Each had important implications for education. Until the printing press came into general use, symbolism was restricted in its impact. Print democratized learning. Slowly book learning spread over the world. Another revolution is now under way. Scientific and technical advances have made possible the development of many new media of communication. Visual, oral, and, perhaps soon, olfactory messages can now be flashed round the world. In this section, contributors analyse some of the social and educational implications of these more recent advances in transmission techniques.

In general, certain criteria distinguish the new media from the spoken word. Most of them are designed to increase audience size. Several ways now exist. Media which give permanence to messages enable successive generations to receive them. The recordings on the sun-baked tablets of Babylon, on stones and papyri were of this kind as indeed were all manuscripts. The numerous copies provided by the printing press not only increased audience size but reduced the danger of total destruction to which earlier records were exposed. The distribution of books over wide areas was a slow process until recently. The barrier of distance could be penetrated by improved means of transportation, but the interval between the transmission and reception of a message remained considerable. Newer media have broken through most of the physical barriers to communication. Vast audiences collected together in one place and at the same time can be addressed through microphones and loudspeakers, or exposed to the symbolism of films. The telegraph, telephone, and teleprinter have conquered distance and given immediacy to the interchange of messages between individuals. To these improvements radio and TV add increased audience size. Messages can be sent to listening or viewing

millions over thousands of miles at the speed of light. Permanent records of such messages can be made with the aid of gramophones, tape recordings, synchroreaders, and film.

Improvements in message transmission brought about by scientific devices can easily be assessed quantitatively. Time lags between transmission and reception, distances reached and geographical areas covered can all be measured. The stage is not far off when a world audience will be able to receive messages from any part of it almost instantaneously. The social implications of this fact are tremendous. Crucial to any understanding of them is the realization that message transmission should be clearly distinguished from the process of communication. Problems of communication have been tremendously increased by the democratization of message transmission.

In most cases of attempted mass communication messages are transmitted from within one context but received within many. The context might be the conceptual framework of an individual recipient or of a particular social group. In any case, as Professor Meredith points out, multiple ambiguity is always possible 'because of the intimate dependence of interpretation on context'. Mr. Carey goes so far as to maintain that 'Accurate communication is rare except between old friends discussing simple questions of mutual interest'—a very radical restriction. The difficulty is present even in cases where the medium is the spoken word—with all its flexibility—and when the communicants are face-to-face. M. Thabault illustrates how even under these circumstances meaning is given to words by gesture, grimace, and intonation. It should not therefore be assumed without question that the spoken word in a face-to-face relationship is the most effective way to communicate. What does the initiator of a message wish to convey to the recipient? Not only information, but attitudes and emotions might also be communicated. In judging effectiveness the functional and intentional aspects of message transmission should be taken into account whatever channel or medium is employed. These considerations arise whenever some people wish to communicate with others.

Closely related to the question of effectiveness is that of economic efficiency. "Economy," to quote Professor Meredith, "is here applied not simply to cost in a monetary sense, but to the balance of effort and attention between the ends to be achieved and the means of achieving them." The cost of sending a message by the most up-to-date methods has to be weighed against the degree of communication achieved. Mr. Carey points out in his article the dangers of misunderstanding in the use of mechanical aids. He attempts to give precision to the degrees of misunderstanding associated with various single channels of communication. His conclusion is that errors can be reduced by the

simultaneous use of more than one channel. This point is illustrated by Dr. Lee in his references to the increased number of channels now available to the teacher. Whether, singly or combined, they are more effective than the teacher with his textbook and blackboard is clearly debatable in terms of learning theory and epistemology.

A central point taken up by several contributors concerns the role of experience in learning. In an isolated group the child acquires knowledge, according to Mr. Palmer, through *immediate experience*. *Information*, on the other hand, is "experience which has been boiled down and crystallized into a set of concepts and regularities, usually expressed in words, but sometimes in the form of maps, charts, numbers, or other symbols". Formalized oral teaching provided information, but the process is characterized by extreme impermanence, hence the emphasis on written work when books became available. New media, now providing mediate or vicarious experience, can redress the balance between information and experience. In a complex world such a balance is of great importance. One determinant of social development is the rate at which information can be stored and disseminated. Reliance on books or oral teaching might seriously reduce learning efficiency. Several contributors, indeed, take up the point that learning is necessarily 'active'. Professor Meredith, who argues that new media should force us to re-examine our basic assumptions, thinks of effective communication as "mutual resonance to novelty within a community". Mr. Bramwell agrees with William James in thinking that learning takes place only when the recipient of a message reacts to it. The degree to which new media contribute to the evocation of learning responses is thus important in assessing their educative value.

These considerations imply that discrimination is needed in the use of various aids to teaching. Dr. Skornia argues that we should not allow the old print-based system of education to be swept away. Just because radio, TV, film, and filmstrip are challenging the authority of the textbook and the teacher, we should be seriously considering ways of preserving what is valuable from the traditional techniques and integrating them with the new ideas to teaching.

Not only in education are new media used to evoke certain reactions. Politicians and statesmen are well aware of the power of radio (and perhaps TV) to evoke a variety of responses. Leaders like Hitler, Churchill, and Roosevelt used the radio not primarily to disseminate information but to evoke emotions like loyalty, courage, determination, and even hatred. To-day many political leaders realize the power of mass media in any struggle for power. The masses can easily be aroused. Once aware of their power they are less easily controlled. For democratic countries the veto power of the masses poses a problem

analysed by Lippmann in his *The Public Philosophy*. New media have made it more acute. Not only is it necessary in a democracy to disseminate information but the powers of rational discrimination between one proposed policy and another need to be developed.

The same is the case as far as moral standards and taste are concerned. Radio, TV, and films might serve either to unify a population or create disturbances within it. Dialectical differences, often associated with class distinctions, might be reduced for example. On the other hand, films which glorify gangsters might contribute to juvenile delinquency. In this, as in the political sphere, a burning issue relates to control. Professor Hiratsuka and Professor Iwahachi analyse some of the consequences for Japan of the control of new media first by commercial interests and then by the ultra-nationalists. Again one need is for an education which will prepare all members of the community to discriminate between the good and the bad.

What is clear, however, is that new media radically extend the size of the community. To quote from Professor Cherry's article: "As techniques of communication have improved, so the size of the social unit has been enabled to grow—from the village to the town, the city, state, and the empire—until to-day we see a world of mutual dependence and the inescapable need for the gradual emergence of a world-society." At the same time, according to Professor Meredith, the civic environment in which the masses of population now live has become depersonalized. Contact between peoples of the world has grown—the dangers of personal isolation increased. The challenge is one of effective social adjustment. In this process, communication media will play a part. One need is for a symbolism which will cut across national barriers. It was towards the achievement of this task that Otto Neurath turned his attention in developing ISOTYPE.

As theory and practice improve, people will learn how to communicate more effectively with others. Teachers will benefit. But what are they to select from the information, vicarious experience, emotions, and attitudes which can now with improved efficiency be communicated? Is the data selected and its method of presentation going to promote hatred or goodwill? Tolerance or the reverse? Faith in reason or in violence? The attitudes developed in individuals through new media techniques will have profound consequences for mankind.

THE EDITORS.

CHAPTER ONE

Communication and Education

COMMUNICATION was at one time conceived as indoctrination. Even to-day any educational system in the framework of an established philosophy or religion tends to use the available techniques of communication to indoctrinate. It is not our business here to discuss the merits of this tendency, but first to point out that if 'communication' is to be a term with a distinctive use, then it must be distinguished from both indoctrination and education. And we shall do well to relate the meaning to the allied concept of 'community'.

In modern usage communication tends to be linked with an emphasis on mass media. Since universal education became everywhere accepted as an ideal, or at least as a necessity, the development of mass media was an inevitable consequence. Communication must always have a medium (unless we include para-normal methods), but ends must not be confused with means. The mass media (or individual media, for that matter) can make or mar communication but they cannot define it.

Modern transport also has added an important power to our capacity for communication. Whether we think of the school bus bringing a larger population to better-equipped schools, the organized school journeys abroad, the conference habit with the travel entailed, the interchange of teachers and students, the decisive factor in all this is that more persons are meeting more persons.

The heaviest price we have paid for modern technology is the de-personalization of the civic environment in which the great masses of population live. The teen-age personality cult of ephemeral stars registers the unwitting protest against the metallic bleakness of our factories, our cafés, even our most modern educational institutions. The grim undercurrent of protest is seen in the waves of juvenile crime. Television, the mass medium *par excellence*, does its best work (to say nothing of its worst) by bringing personalities to millions of homes.

It is easy at a level of intellectual sophistication to take a detached and supercilious view of this supposedly infantile need for personal contact, perhaps an unconscious groping for the bosom in the dark. But do we ever encounter a man who *lacks* all need for personal contact without a certain revulsion? It is not the need we should despise but the meretricious satisfactions of the need offered by our civiliza-

tion. The failure to meet this organic need by organic methods may prove to be the Achilles heel of the West.

Our definition of communication, then, must not only span the extent of the mass media but also plumb the depths of organic need. Communication must be the metabolism of a community. Otherwise it is either the technique of tyranny or the putrescence of a corpse. Since the advent of steam power we have seen wave after wave of technological revolution changing our lives and the face of the land. Each advance has been carried forward by men intoxicated with a new power and oblivious to the need for communal adjustment. The impact of commercial television in our homes is the latest case in point. But is a centralized monopoly the only alternative? It is one of the political ironies of our times that in Britain leading liberal voices joined with socialist protest against the ending of the British Broadcasting Corporation monopoly. Faced with the unlimited powers of modern media, the liberal mind is on the horns of the sharpest dilemma in its history. Can we forge a new concept of communication which will resolve this dilemma? For it is unrealistic to talk of communication in the abstract. There are plenty of catalogues of projectors and films. What any thinking man in the West has to face is the choice between a decaying or a growing civilization, not only for himself but for his children. Technology alone is not the answer. Communication conceived only in terms of technical progress is not the answer. It is to communication as the condition for community that our thoughts must turn.

The Impersonality of Science

One of the beliefs which militate against such a re-definition of communication is the supposed impersonality of science. Since it is in the communication of science that the greatest urgency seems to lie, the tendency to de-personalize communication is likely to increase unless countered. And, indeed, it is not easy to marshal decisive arguments to turn the scientists away from their passionate belief in the necessity for impersonality, a belief which, none the less, is often contradicted by their practices. A cinematic stereotype of the white-coated, pale-faced, tight-lipped, bespectacled, metallic-voiced, cold-blooded experimenter has been allowed to establish itself as a public image of the scientist. It is a protective mask easy to wear, and though the man behind it is as erratically human as Balchin and Snow can portray, and the public probably knows it, his humanity is regarded as a deviation from the image and not vice versa.

Apart from this the whole regular mechanism for communicating science through standardized articles, in standardized journals with

de-personalized styles conceals the personal drama inherent in every scientific discovery, great or small.

Now if the science that came out of this systematic self-deceit was what the world most needed, then the ends might be held to justify the means. But the plain fact is that although more science is being produced and communicated out of this de-personalizing discovery process than ever before in history, no one is satisfied with it either in quantity or quality. Where communication is inefficient the achievements are wasted. Where it is efficient the gaps, disproportions, and distortions become painfully evident. To-day science, having acquired an unprecedented measure of public prestige as a result mainly of spectacular military achievements, and with a manpower no longer socially and politically negligible, is stammering with the embarrassment of a *parvenu* over the use of suddenly acquired wealth. At the same time as its expansion is necessitating far-reaching changes in school and university development, it has lost the traditional vision of the disinterested quest for truth which used to attract the best minds to the under-privileged and under-paid occupations which were all it formerly could offer. Its morale is no longer that of a group of daring explorers, but that of a business which is on the up and up. At the same time, like the political parties in modern elections, it appeals to youth in its manifestoes through an incongruous blend of idealism and self-interest.

In a totalitarian regime the danger of impersonality is countered by the cult of personality. Big Brother smiles grimly from all the hoardings. Given the premises of a totalitarian philosophy, this is sound psychology. In a theocracy the technique is similar but subtler. In a monarchy the method is easier, more open and more natural. The person of the sovereign has a measure of controlled accessibility. A republic which makes its president a father-figure is, in this respect, equivalent to a monarchy. Perhaps the long continued instability of France may have been in part attributable to a failure to find a father-figure. But whatever may be the validity of psycho-analytic concepts applied on this scale (and it is a dubious game with no checks), we have only to use our eyes to observe that the impersonality of institutions begets either spontaneous counter-measures or submissive stagnation or pathological and anti-social reactions. It is within such psychological frameworks that the problems of communication must be analysed. For it is a truism that all language is interpreted in relation to its context. For that matter, so is all perception. A tiger in a cage is seen very differently from a tiger in the jungle.

The Importance of the Contextual Framework in Communication

It is this over-riding influence of context upon interpretation which makes it so difficult to apply the spectacular developments of modern Communications Theory, and of Information Theory in particular, to the most serious problems of communication in its social and educational roles. For in Information Theory the message is deemed to be confined to a channel, and anything in the channel which is not message is 'noise'. By these concepts it is not easy to take account of the multiple ambiguity of all messages because of the intimate dependence of interpretation on context. This is not, however, to say that Information Theory has no bearing on human communication. As I shall try to show, we have here an instrument of analysis and research of immense promise, but also a very arduous task to prepare the way for the fulfilment of that promise. For the purely qualitative analysis of communication, vital as it is to any humanly successful development, will founder into inefficiency unless the economy of the processes themselves is understood.

In a cruder way a great deal of effort has been wasted in the enthusiastic adoption of visual aids and other modern educational media by failing to recognize that, whereas the economy of the voice is always under direct personal control, the variables of visual projection (viz. brightness, distance, size, speed, and timing, not to mention the balance of content) all require deliberate adaptation to the purpose, the audience, and the prevailing conditions. Similar considerations apply with increasing detail to all advances in the technical processes of communication. Economy is here applied not simply to cost in a monetary sense, but to the balance of effort and attention between the ends to be achieved and the means of achieving them. An education authority may order a hundred projectors for its schools and deem itself progressive, but unless the attendant necessities of teacher training in the proper use of these aids—the encouragement of heads to allow the aids to be used, the sustained provision of an adequate supply of films, the minor architectural changes sometimes required, the details of screens and blackout, of power points and room arrangements, of ventilation, of technical servicing, of revision of syllabuses and time-tables to reap the full benefits of the new visual material—unless all these are examined and provided for, only a fraction of the educational potentialities of the apparatus will ever be realized. The old-established discipline of political economy needs to be paralleled by a discipline of educational economy—not in the sense of making small grants go farther than they should, but in ensuring that an

adequate educational budget is administered to the maximum educational advantage.

Sooner or later 'educational advantage' has to be defined in operational terms. Someone has to decide what developments of mind, of character, and of enjoyment are to be aimed at, and what these developments will entail in terms of administrative contrivance, material provision, and human effort. Administration, if endowed with insight and vision, can exert a truly creative role if the economy is fully understood. And educational economy is a matter of effective interactions between children, adults, materials, and buildings. These interactions cannot be made effective by fiat. They can be planned only in the sense that the materials and buildings can be thought out in relation to their human use, and that a manifest value can be placed on their fullest use by the teachers and children.

It is here that an extension of Information Theory might break new ground by enabling the flow of information in a defined system to be analysed, and by comparing the flow in differently defined systems. But 'information' (which already means something a good deal more recondite than the commonsense equivalent of 'semantic content') will have to be given an extended definition to cover the increments of mental structure implicit in educational aims. Such an extension of usage would be possible only in the context of a searching analysis of the curriculum itself. At this point the educationist will find, if he looks, that modern philosophy has evolved an armoury of conceptual instruments at present largely wasted (as far as any social use is concerned) in private fencing between doctrinal opponents. Some few of these instruments, notably Boolean Algebra, have been turned to applications of fantastic power in the design of computers. But there are many more calculi lying idle because philosophers are not interested in communication and educationists are frightened of logic. It took education a whole generation to swallow a few not very adequate statistical concepts. How long it will be before mathematical logic becomes a compulsory subject for aspiring educationists no one can guess. But it really is time to stop gaping at the astronomical speed of the modern computer and to ask how much of the power of ordinary brains is running to waste through continued exposure to unorganized stimuli. And when we start asking these questions we find that experimental psychology is beginning to find reasonably precise answers, notably in the flow of information involved in the exercise of human skill. So far the skills amenable to such investigation are of the manipulative and operational type, but the skill and strategy of thinking is also being analysed. Similar methods applied to the skill of the teacher could open a new era of educational research.

But the point to which we must continually return is that all communication takes place in a framework, or rather, a hierarchy of frameworks. Teaching goes on in an educational system, in a school building, in a curricular context, and in a network of human relations. All these make their contribution to the meaning of what is taught. Moreover, this macrocosm of external frameworks is only half the story. The focus of their influence is the microcosm of the child's inner world, with its native propensities, its cultural schemes from home, from play, from magazines, libraries, museums, from newspapers and hoardings, from radio, cinema and television, from the lamp-lit streets, and the scribbles on lavatory walls. This is no *tabula rasa*, but a system of established meanings with its own structure, its own opacities, its own expectancies, its own resistances, its own hungers, its own inflammability. Such is mind. Blandly to assume that a benign welfare curriculum will automatically imprint itself in such a stubbornly individualized medium is surely as out of date as to suppose that full employment puts an end to all social *malaise*.

The Educational Problem

We may and should solve the logical problems of the curriculum, order its categories in natural levels of generality to maximize opportunities for transfer of training, explore all the overlaps and cross-relations between subjects, eliminate the redundancies, high-light the interests, locate in correct contexts, assign social relevances, adapt to mental levels and background experience, energize by activity, control the vocabulary, illustrate with the brightest and best visual aids, amplify by school visits, personalize by inviting men of fame in the flesh—all this by way of planning the stimuli. But what of the response? The very dichotomy of stimulus and response serves to open wide for critical re-appraisal the fundamental assumption which so much educational theory shares with so much psychological theory. This assumption is that the standard situation for theory to analyse is that of a single organism exposed to an environment. In psychology, the variables of the environment are supposed to be systematically controlled by the experimenter and the organism will then dutifully run through its repertoire of laws of behaviour. In education it is the teacher who controls the variables, and the child progresses through his curriculum with its attendant examinations. That such a dichotomy represents possible and actual situations cannot be doubted, but we should ask whether these situations are typical and, further, whether there may not be important situations lying right outside this analysis.

Even at the sub-human level the understanding of living processes from the study of a single organism isolated, even if only in theory,

from its neighbours, is meagre and abstract. Only by attending to the ecology of living can we gain real insight into the growth of a blade of grass, the appearance of the caterpillar in the hedgerow, the nesting of the blackbird, the chattering of the monkey. A continuing variation of mutual resonance of behaviour rhythms is what characterizes any natural habitat. And man, likewise, cannot live to himself alone. Until education moves over to ecological thinking it will continue this sterile dichotomy of teacher and taught, this dreary routine of curriculum and examination.

To handle multiple resonance phenomena, in which information goes this way and that, radiates and multiplies exponentially, showing explosive discontinuities like the sudden crystallization of a super-saturated solution, the Information Theorist should turn from his telephone cables to the processes in a good research laboratory where, uninhibited by curricular restrictions, by examination requirements or administrative caution, a team of initially quite ordinary people live together with a problem. Here is a living, collective, creative computer whose circulation of information, if measurable, would be as far in excess of that found in the solitary worker as that of the electronic computer is in excess of the abacus.

Now this is the stereotype, the public image of itself, which science should be projecting, for this is the simple and staggering truth. It is not in the cold inhibitions of 'the scientific method', the cautious hedging round of induction, the chaste eschewing of hypotheses, the aseptic precision of terminology and all the other negations of impotent philosophers who have never smelt a laboratory, not, I say, in this wasteland that the productive scientist lives. And it is in the internal combustion of the creative scientific intellect, of intellect interacting with instruments, with phenomena and with other intellects, it is in this furnace that the important thermodynamics of information flow awaits its Sadi Carnot.

But what has this to do with education? Everything. For it is not the fact that such men are making *new* discoveries that is crucial in the process (the discoveries may have been made the day before in a rival laboratory). What heightens the temperature is the *newness to them*. And this is a circumstance which is not the exclusive property of research. Any group exploring a field *new to them* can generate the same temperature, can accelerate the flow of information to the same extent, can enter into this creative condition of mutual resonance. The younger the experience can start the better. For then the internal barriers and insulations by which so many minds are kept stone cold never get a chance to congeal. It is odd that in the history of educational thought, 'Transfer of Training' should have been treated as

synonymous with 'Mental Discipline'. For the latter term calls up notions of grammatical correctitude, of methodological caution, of constipated legalism, of all the negative virtues so essential to the preservation of a stagnant society, so dangerously obstructive to survival in a society which must advance or perish. Whereas 'Transfer of Training', though lacking in poetic elegance, at least suggests movement across barriers.

I have tried to pursue the concept of communication through the sensory gateways into the citadel of the brain itself, for only on reaching this terminus does communication attain significance. And it appears that communication is not a matter of delivering a message like a telegraph boy. It is a matter of sustaining a non-repetitive rhythm of persistently novel information in a triadic flow between minds, instruments, and phenomena. What is of serious concern to education is that most of our educational practices, based on the stimulus-response dichotomy, never allow the temperature to become, as the Zeta-workers say, 'critical'. So the educated mind grows up cold. And, well armed against any new thinking by an internal labyrinth of refractory barriers, the educated mind moves from school to university and on into government, into administration, into the Church, the Law, the safer areas of business and commerce, or, worst of all, back to school to discipline other minds in its own image or to universities to invent new barriers.

Some Outdated Psychological Assumptions

If we are to arrive at a concept of communication which can guide us into a technological era whose pace is set by the data-processing machines, we have a good many psychological assumptions to discard. And we cannot afford too many cold minds in high places. The whole fatalist philosophy of intelligence testing is a dangerous anachronism. All that we are measuring are the congealed inefficiencies of our educational methods and of inadequate mothering. And, since the mind begins in mother's arms, we should cease paying mere lip-service to the 'sanctity of the family' and start a serious application of the new knowledge concerning the mother's crucial role in the development of mentality. There are numerous studies of the pathological consequences of mother-child separation (and the separation need not be only physical to cause damage—the schizoid non-communicative mother is even worse than an absent mother). The habit of communication has to start in the earliest months if it is to be organically grounded in the personality. How many of our educational journals have anything of sustained significance to say to mothers? How many psychoses and psychopathies, how many cold, incommunicative,

sterile minds are even now being irrevocably incubated for recruitment to the delinquency and bureaucracy of 1984?

It is not enough to say that community begins in the family. Many families show a travesty of community. Unless there is organic inter-communication from the earliest months, from which language grows as a natural extension of smile, of gesture, of mutuality of feeling, of security of interpretation, the development of intellect (if not strangled at the outset) arises as a cool, independent, self-protective stream of devices for encasing the ego in barriers opaque to communication. Here lie the roots of tyranny, of obstruction, of pedantry, of the metallic efficiency which generates cold clouds of impotence in all who venture near, and which so often exerts a fatal fascination on the appointing bodies responsible for filling headships of educational institutions.

The second psychological assumption to discard is that we can hope to build an adequate theory of human learning on a basis of experiments with animals. For it is not only that the distinctive and supremely important factor of language marks man out as *sui generis* in relation to all other animals, but also that the duration of his immaturity, and the depth of the mother-child relation, make human learning a phenomenon different in kind from that of the sub-human variety. True, we can see humans sometimes performing at a sub-human level. From a systematic study of human learning we could derive all the sub-human types. But rat psychology has for years been attempting the opposite of this. By reducing maze learning to equations, the followers of Clark Hull aspire to an extrapolation of inference to the laws of human learning which might be called audacious were it not so fatuous. Psychology so readily allows itself to be blinded by methodological epigrams. The celebrated canon, often quoted to the effect that phenomena should never be interpreted in terms of 'higher' processes if 'lower' ones suffice, may, in certain carefully defined contexts, have a certain validity, but its wholesale tacit invocation as an excuse for avoiding the infinitely subtle direct study of human beings in favour of simple and tractable experiments with animals has done untold harm to educational psychology.

The reference to learning is essential in any analysis of communication because communication and learning, though not synonymous, go hand in hand. Learning is forever being augmented and accelerated by communication (though simple, direct biological learning involves no more than the impersonal communication of environmental information—of which a little more may be said later). Communication at the human level can occur only in so far as learning has already laid down a capacity for response. The response of the infant to a schematic

smile may be innate, but soon the smile, as a message signifying all manner of maternal comforts, is *learnt*. A world of perceptual objects is learnt. A language is learnt. A system of expectations concerning human behaviour is learnt. A culture is learnt. And, of course, the whole repertoire of bodily habits and skills, though built on innate capacities for exploratory movement and maturation, is always adapted to environmental opportunity and hence *learnt*. This learnt inner world is the substratum for all meaning.

It is profitable to regard this substratum of learning as a system of *resonators*. It is far from being a continuum, except in the biographical sense of constituting a single individual's stream of achievements. Viewed as a system of potential resonance it is thoroughly discrete, consisting of millions of schematic elements. Our vocabulary forms a large and important cluster in this system and accounts for many thousands of the elements—for a single word is not a single entity in the brain, but an aggregate of phonic, visual, articulatory, manipulative, and semantic schemas. These elements are all discrete in the sense of being able to function independently and in changing combinations. At the same time there is a semantic mechanism forever at work by which one element 'calls up' others, a kind of internal radiation by which element signals to element, rousing it to alertness and putting it into operation.

The brain is thus a system of internal communications consisting of large numbers of discrete elements capable of mutual resonance. It is the 'temperature' of this resonance process which distinguishes the communicative mind from the 'cold' mind. This is, of course, a matter of degree. It is also a matter of novelty. Novelty brings surprise, and surprise is a function of improbability. Improbability is the measure which Information Theory assigns to the 'quantity of information'. We can distinguish three cases. There is the cold schizoid mind in which, although resonance of a kind must be going on, the communication is repetitive, immune from surprise, insulated from stimulation. Then there is the original mind, which may be truly creative in generating surprise not only for itself, but for the world at large, by a continual and progressive variation of resonance; or it may be simply manic, forever surprising itself but lacking the resources to offer true objective novelty. Finally, we have the receptive-responsive mind, hospitable to incoming information and ready with a rich resonance to give as much as it takes. This must be based on an organic habit of communication established in the earliest years.

We cannot legislate for genius, though we can legislate to avoid suppressing it. We cannot predict it nor hope always to understand it until it is dead, if then. We cannot build systems for it. On the contrary,

it is usually genius which lays the foundations for new systems, whether of thought or of practice. It is from the scattered foci of genius in any epoch that emanate the stream of surprises which counteract the randomizing tendency of normal social processes. They provide the mutant genes of social evolution. It is the responsive minds which allow these genes to multiply and to generate novel social organisms.

Self-help and Social Tyranny in Western Civilization

The keynote of Western civilization for about two centuries has been on 'self-help' as preached by Benjamin Franklin and Samuel Smiles. Its energy of enterprise has taken it to a peak of productive efficiency only now being rivalled by the outcome of a quite different philosophy, that of collective enterprise or 'state help'. The survival of both depend on a resolution of the contradictions in each. It is instructive to observe how each system handles the communications of genius. In the Soviet Union, if the genius is a scientist or technologist, he is fed with information, equipment, and staff and he gets his Sputnik into the sky, or his new plants into sub-Arctic regions. If his inclination is towards literature, sociology, or politics his future is, to say the least, lacking in privilege. In the West, on the other hand, a Bernard Shaw can make a fortune or T. S. Eliot gets the Order of Merit, even an Ezra Pound is re-tolerated after dalliance with Fascism, and all manner of social and political reformers in varying degrees can find fame and fortune. Scientific genius, however, although it cannot be choked off or held down so readily as formerly, all too often finds itself half-strangled by thickets of bureaucracy or half killed by administrative burdens. Erect the first radio-telescope and you saddle yourself with a debt of half a million; explore the stratosphere and become a vice-chancellor; penetrate the atom and find yourself imprisoned in a security haunted nightmare of incommunicable research. It may be less severe than Siberia and less cruel than a concentration camp, but what it does to the soul of a genius is anyone's guess.

Into such a socio-historical labyrinth as this must the quest for a philosophy of communication lead us. Is there an Ariadne's thread to guide us out? Let us revert to the etymological link with community. 'The community' has become a convenient myth for concealing the realities of social tyranny, the brute fact of the contradictory relation of dependence and incompatibility between individual and society. This is because the individual is born into a society which he had no hand in shaping and which he has little power to alter. A great deal of social communication consists of the mutual frustration of divergent attempts at alteration, a sort of social homoeostasis which leaves things

pretty much as they were. This is encouraged by government, because so long as society is identified with the body politic any process contributing to stability is welcomed.

Mass media of communication all contribute to this tendency to identify society with the body politic. 'The community' becomes identified with the nation. But if 'community' is to have any organic significance it must be based on two-way communication, on mutual resonance. The forlorn attempts at audience research and public opinion polls testify to the need felt for feed-back on the part of the communicators. But these are mere statistical substitutes for the mutual smile of recognition and adaptation. The poll may mean something to the pollster, but it means nothing to the population.

What these artefacts conceal is a more positive and hopeful reality. This is the reality of organic divisions in what looks, from the viewpoint of mass media, as an amorphous 'Ad-mass'. It is nobody's business to present the picture of these divisions, except perhaps the novelist who, because at best he deals in persons rather than in social abstractions, needs for his screen a limited social organism of interacting, inter-communicating members. Writers as diverse as Louis Golding and C. P. Snow reveal the intrinsic need of the novelist to dissect, not by butchery but by following the boundaries of communication, a living and relatively autonomous piece of tissue from the total body of society. It is in such tissues that most of the realities of individual life have their roots, and they are as diverse and unpredictable as life itself. The sociologist, with his cut-and-dried socioeconomic framework, seldom gets near them.

This does not mean that these tissues can exist apart from the body politic, nor, of course, the converse—however little those who by heredity, by election or by acquisition represent, in their persons, the body politic may be unaware of the tissues from whence cometh their strength. What it does mean is that those individuals with an urge to improve the body politic, a genuine urge as distinct from an exhibitionist need to place themselves in the public eye, should look to tissue cultivation as the method not only of achieving their social objective but of doing so without becoming de-personalized in the process. And, in fact, many thousands of creative individuals who have started societies, founded institutions or built factories, have done just this. They have become nuclei for new social tissue, in continuous organic interchange with their achievements.

This creative process is seen not only in the actual origination of new institutions, but in the vitalizing of stagnant tissue already existing. And indeed, it is here that we see the great mass of innovations on which the steady evolution of a progressive society rests. History

tends to record only the major legislation and the spectacular events on the national stage, but the materials of history are in the tissues.

Innovations, whether by the founding of new institutions or by the vitalizing of old ones, seldom fail to encounter resistance. But as the *Times Educational Supplement* has wisely said (October 23rd, 1959): "No one should be allowed to argue [as some do by implication] that because experiment causes difficulty and upheaval it ought to be avoided." It is Great Britain, perhaps more than any other major power in the Western sphere, that has to take this lesson to heart. For as the stimulus of being 'top nation' has been removed, there is a fatal temptation to slip into the role of 'oldest democracy', to substitute pride in our stability for perspicuity and enterprise. Since 1955 our national production has increased by 20 per cent, while that of Germany has gone up by 60 per cent, and Japan by 100 per cent. To talk of doubling our standard of living in twenty years when confronted with frightening figures of this order, unless mere electioneering, is blatant deception.

Part of the Russian secret lies in a state philosophy in which the concept of dialectic, or dynamic change, is the keynote. America, too, has espoused the mystical doctrine of change as the norm. A country which takes static institutions as its norm, and all innovations as temporary and regrettable departures from the norm, saddles itself with an inertia which may become a *rigor mortis*.

Innovations and Education

It is in education, both as embodied in institutions which may accept or resist innovation and as the most persistent determinant of attitudes, positive or negative, towards change, that the heart of the problem of communication lies. For education is sufficiently near to the mother to reach back and, if it will, influence the events of infancy, and sufficiently tied to the state to force its voice into the counsels of government. Education touches all the tissues. The potential nuclei of tissue cultivation are in its hands. If education is thought of in terms of a curriculum to be imparted, of examination standards to be achieved, of time-tables to be followed, of a one-way communication between teacher and pupil in a static framework, then it is only the defectives, the eccentrics and the psychopaths, all resistant to communication, who escape the compulsion towards stable conformity. Fortunately it is not everywhere so rigid, so inert, so resistant to innovation as to inhibit all experiment. But educational innovators have a harder time now than a generation ago. The determined experimentalist could start his own school in those days. Now economics are against him. The positive advantage of this is that charlatans, too, are deterred and

the teacher with a creative idea must find a way of planting it in existing tissue.

If there is any validity in my insistence on the association of communication with community, then the educational experiments to be watched and fostered are those in which the learning process is based on resonance between children in a group, with the teacher providing the conditions of stimulation, including, where appropriate, all the paraphernalia of visual aids and other media of communication.

Communication is mutual resonance to novelty within a community. The sudden technical extension of its channels to cover the whole globe with a network of waves and wires has caught us all unawares. We are bemused by the noise and the mass effect tends to be titillation rather than education. The parameters of probability oscillate violently. "The difficult will be done at once. The impossible will take a little longer." Science, for so long moving towards an increasing rationalization of the public outlook, reverts to the mystique of magical practices. Nowhere is this truer than in mathematics itself, in which there is even now the stirring of a revolt against the arbitrary axiomatization of metamathematics, a renewed assertion of the autonomy of the parts. It seems likely that mathematicians literally do not know what they are doing. This does not mean that what they are doing is nonsensical or unimportant. It means that their language of analysis is non-communicative and that identity becomes ambiguity. An important possibility of new development is embedded in the present discontent, and since it bears critically on communication it merits examination.

Mathematical Logic and Transfer of Training

The assimilation of mathematics to logic, attempted in the architectonic enterprise of Whitehead and Russell and the subsequent drive towards axiomatization and formalism, made its intellectual appeal because of its promise of a monolithic metaphysic. The vision of a deductive pyramid is alluring. But the facts belie the pretensions. For as the multiplicity of particular branches and applications is subsumed under a handful of abstract concepts, moving up the pyramid we find the proofs of all these derivations invoking an expanding array of arbitrary axioms. Thus as the deductive pyramid narrows upwards it is held there by an inverted pyramid of axioms and undefined terms. The concrete multiplicity that we know at the bottom is made to depend on an abstract multiplicity of unknowns at the top. The dolmen of Deity, which should confer monolithic authority from above, turns out to be an Olympiad of conflicting concepts with suspiciously human attributes. Perhaps mathematical logic will prove to

be the last of the dictatorships to succumb to the irrepressible plurality of man's empirical spirit.

Will half a century of logical analysis then be written off as a dead loss? We wrote off most of the verbiage of scholasticism, so this would not be an unprecedented disaster. But a better fate could be assigned. Mathematics has been immensely busy analysing its concepts, and since many of these concepts originated in geometrical, mechanical, electrical, astronomical, geographical, biological, and sociological facts and problems, we have here an implicit analysis of the structure of science. The function of this analysis has been mistakenly conceived as a programme for the unification of science. If, instead, it is thought of as a programme for laying bare the common factors *between* the sciences, some belonging here, some belonging there, none claiming metaphysical supremacy, the more modest claim can command wider acceptance. For the dispersive development of science is worrying everybody. Specialist cannot speak to specialist, for neither can verbalize the common factors which undoubtedly exist. Here the logical analyst could exert a pragmatic function of immense social value.

Here we revert to the perennial problem of education, 'the transfer of training'. The abstract formula of Thorndike which posited 'identical elements' as the basis of all transfer is still essentially true. But what have the educationists been doing all these years towards giving teeth to this instrument by exploiting the new powers of logic? They have continued to overload the curriculum with a multiplicity of unrelated particulars, bogging the children down in a morass of separate, tedious efforts at learning, when all the time the conceptual tools were available for grouping large areas of knowledge by common factors. The recent work of Bruner at Harvard on the role of categorization in the thinking process takes up essentially the same formula, and provides the wherewithal for a true economics of mind.

But these formulae cannot be applied in wholesale fashion either to whole curricula or to whole educational systems. The individual mind is limited, and works at its best in a community of communicating minds. Such tissue communities may be of many kinds. They can be developed, not only for curricular education in the narrow sense but for all manner of social and scientific purposes. Their dependence on documentary material, on mechanical media, on buildings and finance, is likewise infinitely varied. Their mode of origination, their duration, their means of control, their collective purposes, vary equally. What is the common condition for their vitality and fertility is a basis of personal contact, and not only of a shared vocabulary but also of

shared cues and experiences which are needed to make the vocabulary meaningful and unequivocal.

I have not invented these tissues. I have tried to discern them against the background of noise from the mass media and the posturing of the body politic. A more systematic effort at discerning such tissues in a single locality is described in a uniquely interesting account of a sociological study of communication in the city of Derby by T. Carter and J. S. Downham.¹

The bearing of this prescription on the work of schools, colleges, and universities may be defined as a recommendation to teachers and pupils to assert their needs and rights against the sterilizing and standardizing efforts of administrators and legislators. Ideally, the functions of learning, teaching, and administering should be mutually complementary. If administration is flexible it can become creative. It can watch for centres of growth, for incipient tissue communities of learning arising spontaneously from local discovery or local genius. It can stretch the time-table, modify the budget, depart from custom, allow unorthodoxies of examination procedure, erect huts, and in general give breathing space to experiments. The educational system is made for the child, not the child for the system. But the fallacies of 'self-directed education', of the 'child-centred curriculum', must not be repeated. The individual cells belong to a tissue and are lost in isolation. Education proceeds by communication, and communication is the resonance of a community, of a community, not *the* community.

The Potentialities of Information Technology

We cannot regard this communication of novelty in the tissues of society as merely a continuation of the primitive social metabolism, Malinowski's 'phatic communion' of early man, except in its emotional satisfactions. In content and function it is a transforming rather than a stabilizing process. And it may work with equal force whether the ideas communicated are sound or unsound. In fact, hitherto the bad currency has too often driven out the good. But the new information technology presents us with a situation of unbounded potentiality, and this is the momentous fact to which educational theory should bend all its interpretative efforts. For the thing is on us. If we do not accept its challenge others will. It was not power alone that put the Sputniks into space. It was organized information about metal and fuel, about earth and moon, about space and time, information as-

¹ T. Carter and J. S. Downham, *The Communication of Ideas—A Study of Contemporary Influences on Urban Life* (Chatto and Windus, London), 1954.

sembled, stored, and processed by machines, the human effort coming in at the point of purpose, of interpretation, of application.

The major early promise of visual aids was not fulfilled. True, the film has spread a good deal of knowledge faster and more attractively than could have happened by the older methods, but not fast enough to produce the educational revolution demanded by the times we live in. In part, this is because of the absence of mutuality between the communicator and the recipient and in part the fact that film is simply a medium. It cannot assemble, digest, and categorize its information. And the information which it delivers is in a fixed order and at a fixed speed determined by the machine. But the mind asks questions at its own rate and will progress at the rate at which it finds answers. Probably a large proportion of the information poured out by these (no longer so 'modern') media fall on minds in the wrong phase. The wastage must be prodigious. To-day we have machines which can deliver information, verbal, numerical, pictorial, from any points of a large 'memory' at the times and in the combinations demanded from moment to moment. At present these machines are used for scientific, industrial, and administrative purposes. But they are endlessly versatile, and countries with urgent educational problems are bound to adapt these machines, sooner rather than later, to evolve educational methods commensurate with their needs. The teacher cannot remain at the horse-power stage with the world moving supersessionally all round him.

But it is not simply a matter of making information more speedily available to the teacher. It is a matter of giving new life to educational tissues by systems of documentation geared to the appetite of the learner. In resonant groups the rate of asking questions can be accelerated by mutual stimulation. But the rate of finding answers depends on the supply of information. A group of children working on a project and provided with a well-stocked library, which they know how to use, need only the general direction and encouragement of the teacher to keep them going at a brisk and productive rate for several weeks. The teacher here is not the source of information, but the guide to sources. His limitations are by-passed. The group may finish by collectively knowing more than the teacher, and knowing it in a more active sense than if he had taught them. This calls for a different kind of educational philosophy in the teacher.

The benefits of developing such a 'go-out-and-get-it' attitude to information in children, in terms of stimulation, of encouragement of initiative, of enlargement of horizons, of confidence in handling sources of knowledge and of personal commitment to a theme, all these, and more, should be obvious. But still not enough. It does not always

come off. The themes may be trivial and insufficiently related, either to each other or to the actual information available. And although the experience of going farther afield, of writing to all manner of public or private authorities for more information, helps to develop a new awareness of what the world has to offer, it is geared to the speed of the postal services. Even if the reply comes back in three days, the result is different in kind from a reply which comes back in three minutes or possibly even three seconds. For in the latter case it catches the wave of interest which prompted the question at its peak. The brain, even of a child, can work much faster than the postal services, and faster even than the manual thumbing over of pages of encyclopaedias and dictionaries. Herein lies the strength of the traditional dialectic method of class teaching at its best. For mind gears with mind in a giving-taking mesh of mutually accommodating speeds which can never be achieved in the library, still less by postal correspondence. Its limitation, of course, is in the finitude of the teacher's resources of knowledge, of energy, of sympathy. At its best it is almost unsurpassable. At its worst it is soul destroying.

The combination of teacher with reference books is ampler in scope of information, but jerky in progress by reason of mechanical delays in extracting what is wanted. Even so, this can be a powerful method. I have had a class of eight-year-olds, one hour week by week, asking any questions they pleased on a basis of "I don't know everything but I'll look it up". Between them they scoured the universe. This experience shaped my philosophy and my psychology. Already, at that age, the microcosm is starting to resonate to the macrocosm—until formal education puts an end to such childish nonsense.

The Mechanics of Information in Education

Formal education is limiting, and often seemingly stupid, not for want of efforts and good intentions but because no one has thought with sufficient determination about the mechanics of information. As industry, business, administration, and scientific research move into the new rhythms dictated by computer speeds they create a world so alien to the world of education that it might be another planet. But computer speeds are widely misinterpreted. They are not inhuman. Both input and output are inevitably geared to the human pace. It is the potentiality of the human brain which is so abysmally under-judged, not only in mere speed but in range of qualitative appetite. It does not rival the computer in speed of specialized repetitive tasks. It is not just a slow computer. Rather is it to be conceived as a system containing large numbers of micro-computers capable of a great diversity of tasks. Take any one of these and you can make a single

giant model to do the task thousands of times faster. But take the whole range and the brain is master. This principle is the philosophic key to the new age of data processing. The brain can preserve its supremacy by discarding its inefficiencies—for these are all in the tasks which the computers can perform so much better.

The educational point of impact of the new information technology must be the school library. In effect, it will enable every child or every discussion group to ask for whatever information is needed at any moment and receive an instantaneous answer—as if from an omniscient teacher. But the teacher will be there, too, guiding the questions and helping to interpret the answers. This is the concept of educational documentation, and it will transform the dialectic of teaching. It will enable the human mind to ride the torrent of power released by its own inventiveness. The nation which first adapts the flow of information to the resonance of minds will create the new culture, not by mechanizing the mind but by humanizing the machine. For information is merely the material on which the mind works. To create a new culture there must be no barriers to information. Faced with such wealth, the mind is forced to ask itself how it will spend it and so is driven to determine its own purposes.

PATRICK MEREDITH.

CHAPTER TWO

*Experience, Information, and the Mass Media**

IMAGINE a child growing up in an isolated valley as a member of a Neolithic tribe. Almost everything there is for him to know he will gather, as he grows up, through the use of his eyes and ears and fingers and muscles, through observing and doing. The village crafts, the crops and animals and seasons, the creatures he hunts—of all of them he gains knowledge through *immediate experience*. His knowledge is almost entirely of the first-hand kind that philosophers call “knowledge by acquaintance”. And this is so, even though at first he may be told some things by his elders; such information provides a short cut to knowledge, but in the long run he can confirm it all through his own experience.

Or nearly all; for, very occasionally, he may add to his knowledge in another way. A traveller may come from over the mountains and describe something that he has experienced, but that the tribe in the valley have never seen and may never see: for example, a vast expanse of water, like the lake in the valley, but seeming to go on for ever. He describes it in words, the simple words of a primitive tribe. These words embody some meaning, since they relate to things the tribe *have* experienced—their own lake, the idea of ‘bigger’, and so on; and they therefore light up in the minds of the child and his elders some sort of imagined experience of that vast thing that lies beyond the mountains. Nevertheless, these words are not experience; they convey a different kind of knowledge, knowledge which is second-hand instead of first-hand. The philosopher would call it “knowledge by description”. I propose to call it *information*.

Experience and Information—Two Ways of Knowing

Experience and information: as in our Neolithic tribe, so in the world of to-day we can still divide the knowledge children acquire into these two main kinds. Here are some examples in school. We can tell children about the London docks, and perhaps show them a map—that’s information; or we can show them a film or take them to see

* As an officer of the London County Council, the author is required to state that the Council is in no way responsible for the views expressed in this contribution.

for themselves—that's experience. We can give them a talk-and-chalk nature lesson; or we can take them on a nature excursion or let them keep animals and plants in school. We can tell them about the working of democracy; or we can set up some form of democratic organization in the school so that they can experience the working of democracy in their own lives and at their own level.

Evidently the distinction is a useful one; let us therefore attempt some definitions.¹ *Experience* is knowledge at first hand, knowledge in the raw, or the process of acquiring such knowledge. It comes to us, as a rule, through the senses; but sometimes, as we shall see later, a more important thing about it may be an inner change, in attitudes, or interests, or feelings, in which sense experience plays a minor part. And the senses employed may be one or many. In the laboratory, or in the craft-room, or on the educational visit we are dealing with *Immediate Experience*, in which all the senses are free to work. On the other hand, the still picture, film, sound radio, television, and the other audio-visual media provide experience which is limited in definite ways. For example, the silent film makes experience available to sight but not to the other senses. Each medium has its own characteristics. It is, as it were, 'opaque' to certain classes of stimuli, while letting others through. Even so, the audio-visual media do provide experience. I shall call it *Mediate Experience*, since it comes to us through devices which mediate or stand between us and the outside world. In so doing, they filter off some of the classes of stimuli which, in immediate experience, would be available to us. Later, I shall also have occasion to use the term *Imaginative Experience* and to touch on its relationship to the other two kinds.

In contrast, we can define *Information* as experience which has been boiled down and crystallized into a set of concepts and regularities, usually expressed in words, but sometimes in the form of maps, charts, numbers, or other symbols. We cannot do without it, for most information embodies the ordered experience of the human race. As such, it comes to the child through the words (usually) of the teacher or textbook, or, better still, he digs it out himself from the simple reference books in the school library. But as well as using information which is supplied to him thus ready-made, he creates information actively, for himself, out of his own experience. He sets his own ex-

¹ Much of the analysis contained in this chapter was first used by the author in a departmental paper prepared for the School Broadcasting Department of the B.B.C. in 1945, and applied in detail to the principles of educational broadcasting in his *School Broadcasting in Britain* (B.B.C., 1947). A partly similar approach to various educational media is well illustrated in Edgar Dale's *Audio-Visual Methods in Teaching* (Dryden Press, 1946).

perience in order and puts it into words or charts or tables. He cannot learn everything in this way, for there is too much to know and time is short, but what he learns in this way he is unlikely to forget.

In a well-balanced education, experience and information are partners. Personal experience must be set in order—converted into information—if it is to be applied readily to new cases and communicated to other people. And without that wider information which is the crystallized experience of the human race it is incomplete. But information not grounded in personal experience is meaningless. Words and other symbols need to be backed by real commodities if they are to become a genuine currency. The very words we use in teaching only have meaning for the child in so far as he can interpret them in terms of his own experience. A balanced education is thus a single pattern, of which experience and information are the warp and the woof; each interprets the other and creates a felt need for the other; and so the pattern goes on in an ascending zig-zag.

The right balance between the two varies, however, from one society to another. In our Neolithic valley, education could consist almost entirely of the acquisition of immediate experience and the know-how² that this engenders. Knowledge was bounded in space by the horizon and in time by the limits of an oral tradition. There was little else to know. In the complex, inter-related modern world we cannot be content with knowing what goes on in our valley. We must know about the other side of the earth—and now, about the other side of the moon. And recorded knowledge takes us back in time. Here and now are not enough; we must take in there and then. Not only this; even within the confines of our immediate environment, science, the ordered application of reason to experience, has taken us beyond a mere know-how about everyday regularities, and has built a super-structure of theory which enables us to return to practice with greater power. There is an awful lot to know, and by far the greater part of this knowledge must come in the form of information rather than of experience.

² This term—however it may have become vulgarized—has considerable usefulness in educational thinking. Know-how arises from the unconscious organization of experience into a kind of knowledge which may not be expressed in words, but which is none the less useful in practice. The garage hand and the young child often possess this kind of knowledge. Piaget's nine-year-old, who could indicate where a shadow would come, had know-how about shadows; though he could not state in so many words that the shadow of an object comes on the side away from the light, and, when asked for an explanation, said that the shadow shuns the light. In teaching science to young children we must often be content with experience and know-how, and let generalization and explanation wait upon maturation.

All this, perhaps, is fairly obvious. What is less often realized is that a right balance between experience and information in education, achievable in primitive societies and again in the world of to-day, was hardly *possible* in the modern world until the present century. Victorian education is often criticized for its emphasis on verbal information and its remoteness from experience, for its geography of capes and bays, its history of dates and kings, and biology (if any) of definitions. And no doubt many teachers were content enough to follow a dreary tradition of verbal teaching to which they were accustomed. Yet it is easy to see that education in the few centuries before the present one was faced with a peculiar dilemma. The world had acquired a complexity comparable with that of the world of to-day; knowledge was increasing at a vast pace; there was a lot to be known; and yet the means of knowing it *by experience* were almost as restricted as they had been throughout man's history. The enrichment of immediate experience was limited by scanty means of transportation; few children before the age of railways had ever travelled more than a few miles from home. And the only sources of mediate experience were still pictures—and, perhaps, the waxworks. Even pictures, designed to show the pupil what unfamiliar things look like, were not so very common in school books until the second half of the nineteenth century. It is hard for us to realize how little even literate adult people could know only a hundred years ago of the appearance of things which were not available to immediate experience. Compare the child of to-day: his eyes are glutted with pictures—and this without counting films and television. Every day he sees them by the hundred: on hoardings, in public transport, in magazines and newspapers, in books in and out of school. He may not study many of them closely, but from such a multitude of visual experiences, each designed to catch attention, even the browsing eye can take in a good deal. So he gains, almost unconsciously, a rich fund of visual experience of people and places and things, of far countries and distant times. And, if he pays a little more attention, he comes to link some of the words that go with the picture to the visual experience it provides: he learns the names of things together with their appearance. And so, later on, the knowledge that comes to him as words alone, as information, acquires some sort of meaning in terms of experience.

This is only one example of the role of a medium, in this case the still picture, in modern education; we shall examine the other varieties of mediate experience in a moment. Between them they are helping to shift the emphasis in educational method from the Victorian reliance on information which was often meaningless to the child, towards a balanced partnership between the two sources of knowledge. The

audio-visual media have gone far to make that balanced partnership possible.

Immediate Experience and Modern Education

But there has also been a change of attitude over the years towards the use of immediate experience in education. Many have contributed to this, and especially John Dewey and his followers. This new emphasis on immediate experience has affected all stages of education in the present century, but especially the education of young children up to eleven or twelve, in which the phrase "activity and experience" has become a guiding principle of education. And this is appropriate, since so much that is learnt in the later stages of schooling, and when schooling is over, must come in the form of information which only has meaning if it is grounded in experience. At the primary stage, therefore, experience is not a 'frill', as many older teachers were apt to think, but an essential element in fundamental education.

The child of to-day builds up a rich fund of immediate experience in innumerable ways. Many of these belong to his life outside the school, and the wise teacher does not fail to make use of them. These out-of-school experiences, however, are unselected, or selected only by interest and opportunity. The good school, on the other hand, provides a selected sequence of experiences, appropriate to each stage of development, and often simplified and brought to a focus in such a way as to make them memorable. Some of these, especially in the early stages of education, may be left to 'simmer', to do their work unconsciously in the building up of know-how and in giving meaning to vocabulary. Others, and progressively more as education proceeds, will be set in order, generalized and classified, converted into information, into words and charts and tables by the child, or by the child and the teacher. And to this body of self-ordered information will be added, stage by stage, as experience makes it capable of carrying meaning, some part of that great body of ordered knowledge, of information, which we owe to other people.

That is the general pattern of the acquisition of knowledge in good schools to-day, and, in this, immediate experience plays an essential part. The child gains immediate experience of things, living and non-living, in nature-study or science or craft; experience of other places through the school journey and educational visits; experience of times past through museums and through visits to places of historical interest; experience of artistic creation and enjoyment through his own activity and through visits to picture galleries and concerts; experience of people, again through educational visits and school journeys, but also by way of the visitor to the school, coming, perhaps, to tell about

his job; and, finally, there is experience of a very important kind, of human situations, and the give and take of democratic discussion and decision, in school clubs, councils, committees, and in group work in class.

Immediate experiences can differ in their impact for a variety of reasons. In the first place, it is probably true that experiences which entail *active participation* on the part of the pupils tend to make a stronger impact than those which do not. For this reason most science teachers, for example, set a high store by individual practical work in which the pupil is able to manipulate things himself. They would add the proviso: "other things being equal"—and often they are not. Thus a demonstration experiment, though it lacks the merit of direct pupil participation, is often economical of time and apparatus; it makes its point as a step in exposition without delay or fuss; and often it is the only suitable method when skill in manipulation or factors of safety are involved. Nevertheless, it is a good general educational rule that experiences which entail active participation should be sought wherever possible. Experiences which have a purpose, in which the child is concerned to make something, or to find something out, make a strong impact because the child's motives are brought to bear. Probably some of the most vivid and formative experiences are those in which a child initiates a line of discovery, and in which the pattern—experience, information, directed experience—is allowed to work itself out with very little intervention from the teacher. Thus a girl of thirteen, in the course of leisure-time nature activities under the general stimulus of a brilliant teacher, happened to observe the scatter of sycamore seedlings round the base of the tree. This was the initial experience in the pattern, and she then proceeded to seek ways of setting this experience in order, of converting it into information. With a little help she plotted the distribution of the seedlings along various radii of a chart drawn with the tree as the centre. When she had done this she could see at once that the distribution followed a definite pattern, with more seedlings along certain radii than along others. The next step was an hypothesis of explanation—was the distribution due to the prevailing wind? This, in its turn, led to a directed seeking of experience—a series of observations on the wind-direction at that particular place. The encouragement in children of such patterns of self-initiated discovery demands in the teacher qualities of self-restraint and unobtrusive guidance which are rare. Note also that the most important experience for the child in this activity was not the sense experience of sycamore seedlings and wind, both of which were familiar enough, but the inner experience of the excitement and discipline and power of a scientific quest.

This example also makes one realize that bodily activity is a most inadequate test of the degree of active participation in experience. You may drag a child round a nature walk and bombard his senses with sounds, sights, smells, and touches, and yet he may remain completely passive if he has not been led, by suitable preparation, to see the point and purpose of it all. Conversely, there may be great imaginative activity with little to show on the surface. Who knows how children are stirred by sitting in a chair in a Tudor room at the museum, or by holding a palaeolithic hand-axe, or while listening to a dramatized history broadcast? All these, as well as the more physical kind, are active experiences, and we must weigh them up as best we can in judging the value of different experiences to children.

Active participation, then, is often an important characteristic of those immediate experiences that make a strong educational impact—though we must bear in mind the proviso “other things being equal”, and the need to use teaching insight in judging what is ‘active’ and what is not. A second characteristic which often influences the quality of an immediate experience is what may be called its ‘wholeness’. A Tudor chair as an isolated exhibit affords a less complete experience of a Tudor chair than if we see it in a period room where it forms part of a whole. In the same way an animal belongs to a larger whole, its natural environment. When we experience it in a zoo or in the classroom, the experience is to that extent incomplete. Even so, there are sometimes advantages in the experience which has been ‘edited’ or selected or isolated from its natural context—as, indeed, is commonly the case with the immediate experiences provided in the classroom and laboratory. They have been contrived and arranged by the teacher instead of being taken as they come as part of the outside world. This is inevitable, and sometimes has the advantage that such experiences can be brought to a sharper focus of attention and studied at leisure. It needs to be remembered, however, that such isolated experiences are abstractions from larger wholes and need to be supplemented by experience of their natural context. In biology teaching, for example, the movement towards field studies is in part a recognition of this educational principle.

Mediate and Vicarious Experience Distinguished

What comes to us as *immediate* experience is supplemented in the twentieth century by *mediate* experience gained, for example, from still pictures, film, and radio, and it remains to consider what these sources of experience can give. First, however, let us clear up a source of confusion. Some writers have used the term *vicarious experience* for any experience derived from the audio-visual media. I suggest, however,

that this useful term is better reserved for the kind of imagined experience that comes from reading or hearing a vivid description by someone who has had (or pretends to have had) the experience at first hand. The term is applicable to the imagined experience derived from vivid story-telling and description in general, but it is perhaps particularly apt in the case of a present-tense radio commentary. This may, of course, be a genuine running commentary on events which are happening at the time, or it may be a device employed by the radio writer to heighten the imagined experience gained by listeners from his descriptions of a scene which perhaps he could never see. This device has been used, for example, to great effect in the B.B.C. school series, "How Things Began", in which a "B.B.C. Observer in the Past" gives present-tense commentaries on scenes from pre-history and still earlier times.³

Vicarious experience, therefore, comes to us in the form of words, or rather is engendered in the mind because the words have meaning for us in the light of past experience. The words are 'information', as I have used the term here, though information of a particularly vivid kind, since the writer or speaker claims to have seen or to be seeing what he describes. But it is he who does the seeing, at first hand, for us, translating his experience into words, and leaving us as best we can to translate these words into imagined experience. In contrast, *mediate experience* is the real thing; it *shows* us what things are like instead of *telling* us about them in words; but it falls short of complete immediate experience in respect of those classes of stimuli to which each medium is opaque.

Mediate Experience through Visual Media

We can illustrate this last point in more detail by considering the various ways in which a child may have experience of an animal. Handling it alive, in the classroom, or perhaps even better, in its natural environment, provides the most complete immediate experience of it. All the senses, including nose and fingers, are free to work. The same animal in the zoo is a small step away from complete immediate experience. The child can still see, smell, and hear; but touch is out—unless the keeper is obliging. Still, since this possibility exists and the live animal is there in the flesh, perhaps we may regard this experience as being still of the immediate kind. Now the same animal in a museum: you are left with sight—but in full colour, life size, in three dimensions, and often you can see all round it. But the animal is now dead; the child gets nothing of its movement or its behaviour and it does not respond to him—a thing of much importance to children.

³ See *School Broadcasting in Britain*, pp. 107 f.

We are perhaps getting rather near the shadowy borderline between immediate and mediate experience; however, the animal is still there in the flesh—much of it—and we can perhaps regard this as an immediate experience of a *dead* animal, especially if the curator opens the case and enables the child to add touch to the evidence of his other senses. And now we cross the borderline and come to film and television; and at once the senses we are free to use are sharply defined by the properties of the medium. Smell and touch are out; to them the medium is opaque. But hearing may be catered for almost as completely as by immediate experience, and sight to a degree which will vary according to whether the medium is in two or three dimensions and in black and white or colour. Point of view is determined for us, but here the producer may arrange that we get a varied selection. And the animal is alive and in motion; indeed, the film may select and pack into ten minutes a wider range of movement and behaviour than would be available to immediate experience in a whole day's observation at the zoo or in nature. And so we come down to the still picture, in which we are not only limited to sight but to sight at one instant only and from one point of view, except in so far as a series of stills can give us a sequence of movements and variety of viewpoint. Here again, however, the patience of the photographer or the skill of the artist may capture an experience for us which, in immediate experience, we should be likely to miss. The still picture, of course, ranges all the way from the colour photograph, perhaps seen in 3D in a stereoscope, to the naturalistic line drawing, from which all the qualities of an immediate experience of the animal may be abstracted except its shape. It might be thought that there was a further step, the *diagram*, but I suggest that this is better considered as a form of information, as an aid to interpreting and a way of summarizing visual experience rather than a way of showing us "what things are like". For completeness one should perhaps include among possible experiences of an animal the naturalistic model, differing perhaps in scale from the real thing; and the diorama which often includes actual specimens arranged against a painted background designed to simulate a three-dimensional scene.

Mediate Experience through Aural Media

Mediate experience of sound (through radio or recordings) does not exhibit all the fine gradations of sensory abstraction which we have just examined in the case of visual experience. There can be stereophonic sound and monaural sound, but this distinction is not at present of wide educational importance. It is more interesting to consider the various ways in which mediate experience of sound can be used to

enrich immediate experience. One obviously is the recording or broadcasting of music, which can now give us, with much faithfulness, the sound of a great orchestra, though not, except through television, the sight of the players in action. Then we have what might be called the "museum specimen in sound". A recording of bird song or one illustrating the pronunciation of a foreign language will serve as examples. In all of these the focus is on the sound as such, and the fact that the medium is visually opaque is not of great importance. In a slightly different category is the experience provided through sound radio of outstanding men and women of our time. Obviously this is a less complete experience of them than meeting them in the flesh, or seeing and hearing them on television. Nevertheless, this is a real sensory experience of them, as compared with reading what they have to say in print; something of their personalities comes over in their voices, and the impact of their communication is strengthened by the sense of 'immediacy', the feeling that they are there in the flesh, talking to us. This quality of 'immediacy' in radio may also strengthen the vicarious experience we gain from people who may not be outstanding personalities in their own right but who have first-hand experience to impart.

In all of these examples of sound experience through radio or recordings there is no illusion; it is accepted by the listener that the eminent speaker is in the studio, the orchestra is in the concert hall, and that the sound specimens are recordings. In certain other forms familiar in sound radio, the psychological situation is rather different. We appear to be in the position of a blind man listening in to the sounds of an actual scene; to the visual aspects of the scene the medium is opaque. This is partly made good, however, in many cases by a running commentary which gives us, through words, a vicarious experience of what there is to be seen, to supplement our mediate experience of what there is to hear. Such radio experiences may bring to us an actual scene (such as a coronation or a sporting event) which is going on at the time. But they may in fact be studio reconstructions, synthesized out of actual recorded sounds, plus the voices of actors and a commentator, who describes the scene as if he were in fact seeing it. In this way the listener is given the illusion of experience, through the sense of hearing, of a scene perhaps in another country or even in the past. How far this can count, not merely as vicarious experience but as an actual extension of experience, depends on the faithfulness with which the sound reconstruction has been done. In the visual field it has some analogies with the experience provided by an artist's impression of an historical scene, amplified by a vivid caption, embodying not only descriptive commentary but some of the words that were said.

There remains radio *dramatization*, in which the real or pretended link between the scene and the audience provided by the commentator is dispensed with, except in so far as the scene may be set in introductory narration. The voices of the actors portray contrasting characters, and, combined with appropriate sounds, give the illusion of action. We are eavesdroppers, listening in, unseen and unseeing, to something happening; and, if the dramatic writing takes due account of our lack of sight the scene may be in a large measure completed by visual imagination. Dramatization can play a particularly important part in the history broadcast to schools. If the reconstruction is done with artistry and scholarship it gives children a kind of experience of the past which would rarely be available to them in any other medium, since the historical film is usually too costly to produce for educational purposes. Dramatization may also be used in literature broadcasts to bring within the compass of children stories which would be rather beyond their scope if presented through the printed word alone.⁴

Conclusion

In this brief review of the audio-visual media, they have been considered solely as providing means for the enrichment of experience. It would be quite wrong to suggest that this is all that they can give. The film, for example, can combine the naturalistic picture and the animated diagram with tremendous expository force and economy of presentation; and can use its power to play tricks with the time dimension to make us aware of sequences that would elude the unaided eye. The museum can present us with a kind of "essay in specimens" which makes clear their relationships as well as showing us what they are like. Such examples of the expository power of the audio-visual media, their capacity to clarify information as well as to enrich experience, could be multiplied indefinitely. They will be considered more fully elsewhere.

⁴ The relationship between mediate experience of a story and the imaginative experience of it derived from the printed word is discussed more fully in the author's *School Broadcasting in Britain*, pp. 42 f., 59, and 130. The printed story depends on words alone, and the imaginative experience engendered in the mind by them relies on the richness of the reader's own experience of life to give the words full meaning. The radio-dramatized story provides, as well as words, mediate experience—character portrayed in voices, and the sounds that accompany action; and these additional clues reduce the demands made upon the listener's own experience. Film and television drama reduces these demands still further—though, like radio drama, they have also their own special qualities as art forms. Even so, it is a nice point for discussion whether this transition in story-telling from the printed word to more and more complete forms of mediate experience is all gain, or whether we are not sometimes in danger of spoon-feeding the imagination too much.

Nevertheless, I suggest that the unique contribution of the audio-visual media lies in the enrichment of experience. Through immediate experience we take the school to the world; but here there are limits—of time and place and possibility. Through mediate experience we bring the world to the school, not in sensory completeness, but to a degree that often serves our purpose.

Immediate experience and mediate experience, like experience and information, are partners in education. Each must supplement the other; how they can best do so, in a given teaching situation, is a matter of teaching judgment which the teacher, in contact with the pupil, must never surrender. Between them these two sources of experience can give meaning to that vast body of information which is at once the triumph and the educational problem of our age. Without them both, knowledge degenerates into verbalism.

RICHARD PALMER.

*Telecommunication—Its Social Background and
Some Implications of Modern Developments*

It is commonplace to remark that man's development and the growth of civilization have depended mainly upon a few outstanding technological events. We might single out the discovery of fire, the invention of the wheel or the plough, the development of printing, the understanding of electricity. Such events have altered the whole pattern of society, whilst the rest are, historically speaking, trivial. But one group of activities has been of special significance, namely the development of means whereby man records and communicates his knowledge, or sends advice, orders, or demands to his fellows. Communication is the cement of society. As techniques of communication have improved, so the size of the social unit has been enabled to grow—from the village to the town, the city-state, and the empire—until to-day we see a world of mutual dependence and the inescapable need for the gradual emergence of a world-society.

Though such major steps in our evolution are technological in character, it seems a mistake to regard the evolution itself as a consequence solely of technological events. For these events are part of the whole historical and cultural context of the society which produces them. We might well ask: What are the situations which cause these inventions to be made? What needs, what philosophical backgrounds? We might better inquire into human motivation, into the origins and growth of the great ideologies and faiths which humanity has created, fostered, and used to guide its thinking and action. The great technological advances in storage and propagation of information have permitted such growth by removal of constraints of time and distance; though we must not belittle such advances as 'merely' technological; they are an essential part of the fabric—for without them administration would have been impossible, law could not be maintained nor food distributed, the growth and spread of ideas would have become stultified. But from the time of the first stone inscription man's thoughts had continuity and extension and, as techniques improved, the extension and growth of social areas of interdependence have been permitted, until to-day our thoughts are world-thoughts; our actions are

not confined to our village but their consequences can be world-wide, their repercussions coming with the speed of electricity.

In this article I hope to review briefly the very rapid growth in recent years of the technology of telecommunication, to indicate some of the social causes of this development together with some of the consequences; finally, to sketch briefly the way in which those *theoretical* studies that have sprung from telecommunication are fertilizing certain social sciences.

Communication Techniques bring Awareness of the World's Troubles

At risk of appearing a heretic, I would like to suggest that human misery to-day is, at least, no worse than at earlier periods in history. Evils are not inventions of our present century. Surely the troubles on our conscience, which are the mark of our day, are so *because* of our widespread awareness of the evils. I can scan my daily newspaper in a twenty-minute train journey, and gather some knowledge of the main events of the whole globe. The tragedies, the distress, the arrogance and brutality of every nation are always with us, with a rapidity and urgency unknown to our grandparents. The technologies of printing, of broadcasting, television, and film have loaded this bulk on to the conscience of every literate man and woman. And it is the accelerated growth of these technologies, within our own generation, that has thrown this load upon our backs, with a suddenness which has brought us to our knees.

The newspaper reader to-day tends to see only the international disagreement; only the failures of conferences, only the great tragedies. He is far less aware of the enormous bulk of small but vital success in international agreements, the rather mundane and undramatic achievements of the League of Nations and now of the United Nations, and a host of other organizing bodies responsible for world agreements, which oil the international mechanism. For the mechanics of living are the first essential; world agreement on means of trade and exchange, operation of law, security of travel and navigation, allocation of broadcast wavelengths, control of pests and epidemics. There is a steady record of achievement in such necessary matters—though there is no drama. These are the technologies—economic, legal, medical, scientific—which provide the framework within which we seek to develop our 'ways of life', our cultural and artistic tradition, and our ideologies. This framework we must have if we are to contemplate world integration in any form. It is rapidly growing and we are made increasingly aware of our varied purposes and ideologies as we are forced into social contact with our neighbours on this congested planet. But it is the accelerated growth of communication techniques which

has made this impact so much the greater upon each one of us; the technology of telecommunication is changing the whole size and shape of our world.

The Growth of Telecommunication

Whereas before the turn of the present century the transmission of messages was very largely restricted to the speed of the horse, the train, and the ship, once Marconi had performed his epoch-making experiment of sending a radio message across the Atlantic in 1901, the constraints of time and distance were seen to be removed, overnight, upon governmental, diplomatic, police, military, and other systems of social control. News of any event, of insurrection or disaster, could now be whistled instantly round the world. The speed with which action and counter-action could follow one another was raised by many orders of magnitude within a generation. From the time of that first radio message there seemed to remain no safe place, no isolated corner of the globe. The dramatic arrest by the British of the murderer Dr. Crippen on board ship in mid-ocean, just before the First World War, as a direct result of the new 'wireless', caught the imagination of that generation and seemed to symbolize the immense social consequences of the invention.

As early as the year 1267 the possibility of remote communication, going round corners and not restricted to the line-of-sight, had been visualized by Roger Bacon, who saw the possibilities of "a certain sympathetic needle", the lodestone. But it was the intense researches into electricity and magnetism by men like Faraday and Kelvin in the nineteenth century, together with the theoretical work of Maxwell in particular, laid upon the secure foundations set by the great mathematicians a hundred years before, that made the pace. These intellectual triumphs opened the eyes of inventors and practical-minded men to the great social possibilities, and from the turn of the present century began a spate of experimental work, carried out often in the spirit of try-it-and-see, with the vision of world-wide communication as the goal. But Marconi's remarkable spanning of the Atlantic caught the public imagination most of all. This feat acted as a symbol of things to come, in the same way as did the Russian Sputnik two years ago.

By 1907 a regular trans-Atlantic radio service had been established, for Press and private use, and the significance for naval strategy fully realized. As always, war provided an intense stimulus to scientific activity, and the period after the 1914-18 War saw the establishment of regular inter-continental cable and radio communication. The invention of the amplifying valve, in 1908, again widened the possibilities

and opened the way to mass broadcasting, for entertainment and surely also for the most massive public educational advance that has ever been made. Perhaps some 'intellectuals' may deplore the standards of much broadcast entertainment, but to be fair one must set the whole distribution of present musical, cultural, and scientific interest against the corresponding distribution over the population as it was in the pre-broadcasting era. Above all, people of all classes and conditions are now brought face-to-face with prominent personalities, with a realism and actuality previously unknown.

The Economics of a Telecommunication System

The capital cost of a telecommunication network is enormous. It can only be operated economically if the maximum use is made of it by sharing all facilities amongst as many users as possible. In the case of line telegraph and telephone systems the greatest advance in such economy arose from the invention of various means for sending many messages simultaneously over the same wires—the *multiplex* systems. Consequently, a great deal of ingenuity and thought has been given to multiplex operation of telecommunication systems.

In radio or television broadcasting the various programmes are sent by carrier waves operating at different wavelengths, so that they lie 'side by side' on a scale of wavelength, as you see on your radio tuning dial.

The reader will certainly have heard of 'aether congestion', by which is meant the fact that if too many radio stations are permitted in the world there are not enough wavelengths to go round, with the result that the stations interfere with one another. International conferences are regularly held to sort this problem out agreeably between the various countries. Now a very similar thing happens on telephone and telegraph lines; the messages must not be packed too closely to one another, or they interfere. The reasons are fundamental and mathematical and cannot be overcome by sheer ingenuity. For economic reasons we are always trying to pack in more messages and programmes, but there is an inevitable limit.

By the late 1920's the various systems of sending many messages at once had had extensive trial. Many different coding systems were used, but in every case there seemed to be a fundamental limit to the messages which any telecommunication channel could send. It seemed that this limit was set by nature, which no inventive genius could overcome; indeed, this eventually turned out to be the case, though another twenty-five years was to pass until the real mathematical basis of this *capacity limit* was understood, in 1949.

We shall be returning to these ideas a little later on, when we come

to discuss the new scientific work called Information Theory (or, sometimes, in a more restricted sense, Communication Theory) which, together with its influence upon a number of social sciences, is what we are leading up to. But first we should glance at technological means of social integration other than telecommunication, for they have all been influential upon the growth of these mathematical *information* studies at which we shall look later.

Social Integration is both Cultural and Technological

Earlier in this article the distinction was drawn between the 'mechanics' of social organization and the 'purposes' of social life; broadly, between the technological means of communicating, organizing, and controlling, and all that is implied by the term 'culture'. The culture of a community arises from its common language, from its universal modes of thought, its symbols and ideologies; but such common patterns can only arise by human communication and contacts, by education, by systems of law and, as stressed already, these patterns have been permitted to grow rapidly within living memory by major technological advances in communication.

The possession of a telegraph or telephone network gives enormous power to governments, the police, and security services (as witness the British Government's seizure of the telegraph system to help crush the Chartist rising of 1848). Again radio and television should not be thought of as a mere means of entertainment, but social, political, and educational instruments of the first importance.

But there are many other parts to the social 'mechanism' that are less prominent to the public eye. The maintenance and welfare of a vast community demands accurate prediction of its future needs, immediate and distant; consequently it is part of government to gather statistical data of many kinds to facilitate such prediction, in the form of trade and industrial censuses, market research, man-power statistics, and a host of others collected by Ministries, Boards of Trade, and Labour Offices. Without such accumulated data not only could countries not avoid internal anarchy but they could not trade and live with one another.

The pressure for raised standards of living, as awareness of its possibility emerges in the less-developed countries (as we see happening at such an accelerated pace to-day) calls for communication services of all kinds before industries can be set up effectively for better social control, and for prediction of social needs. And as the industries and social services develop, the hunger for informational services in many forms intensifies. *A society can develop and advance only as fast as it*

develops and advances its means of collecting, storing, and disseminating information. An illiterate society is a frozen society.

The relative 'advancement' of a civilization is a matter of opinion, based upon one's personal sense of values, but our argument here is that one objective measure of advancement could be the scale of magnitude of its informational services (i.e. its telecommunications, printing, census data, libraries, and documentation of all kinds). Such a measure is distinct from the possession of raw materials and sources of natural wealth; rather it emphasizes the degree of organization and potentiality for the use of wealth.

Expenditure on Informational Services

But how can we measure "the totality of informational services" in an industrial society? Possibly we cannot, nor is there any particular purpose in trying to put a figure to it. It is rather the technological basis to these various services which is here emphasized as the significant matter, and the necessary technological equipment represents so much capital investment. Perhaps this capital investment would provide the measure we require, as a guide to the degree of 'social advancement' in the sense of our present context.

In Britain, for example, there are not only essential internal telecommunication networks, under the General Post Office, government publications from the Stationery Office and many other keys to the operation of government and industry, but equally essential informational services linking with other countries. Thus there are those provided by the Foreign Office, the Board of Trade, the British Council, the Commonwealth Relations Office, the British Broadcasting Corporation, the Colonial Office, and other government departments. These are all involved in increasing expenditure, since their value is beyond question for industrial, commercial, educational, political, and all other social ends.

These various services seek to use communication technology on an ever-increasing scale—telephone, cable, broadcast, television, film, print—a technology which represents a vast capital investment.

Clerks—Human and Machine

The expansion of our modern industrial society brings in turn fresh demands for still better technical aids, as an economic necessity, as education, skill, efficiency, and living standards rise. But a great part of the informational services of our community has, as yet, relatively little technology in its functioning, being maintained by human clerical operations of many kinds. The wretched ledger clerk was one of Dickens's symbols of the nineteenth century, with his stool, quill-pen,

and books; to-day we can no longer afford him. One of the signs of our present day, in the advanced countries, is the rapid take-over of clerical tasks by machines, in the form of office mechanization; a whole new industry of punched-card filing, sorting, and classifying machines,¹ has developed.

These automatic punched-card machines find their greatest use in government departments, census bureaux, public utility companies, offices of major industries, and other large undertakings. They are capable of recording and storing enormous quantities of data concerning people and their needs. Such data may automatically be sorted, counted, classified, and processed in various ways, or used for statistical analyses, serving vital social purposes for which an army of clerks would be a hopelessly uneconomical substitute.

Another development, characteristic of our generation, which has emerged from the same technological origins as the punched-card accounting machines, for very similar social reasons, is that of the high-speed digital computing machines—the so-called 'electronic brains'. Such machines cost a great deal of money, which can only be provided by the government or by very large undertakings. And this money is found, because it is a social and economic necessity that we have such mechanization both for so-called 'pure' mathematical and scientific research (taking over the labour of an army of clerks doing arithmetic) and for more immediate business and industrial needs.

These machines may be used, for example, to try out 'on paper' different possible planning methods for large industrial plants, with the aim of avoiding major economic and operational disaster which can result from the empirical approach with its dependence upon experience. There has recently been much publicized the use of a British computer for estimating the most economical way of running a new electricity supply undertaking in Sweden before it was built. Such industrial undertakings are now becoming so large that machine prediction methods become essential, for otherwise the social experiment of an empirical approach carries too great risks. We must expect to see more computer-aided planning and prediction of this kind in major administrative problems like budgeting—or at least hope to see, for though the social necessity is clear enough, we are forced to be increasingly aware of our abysmal ignorance in the social compared to the physical sciences.

These giant 'electronic brains' do nothing but simple arithmetic, but they do it at lightning speed. The thing that gives these machines

¹ The *Financial Times* (London) has published a survey (Nov. 4, 1957) of such office equipment.

their great economic value is their prodigious capacity for storing information. Their 'memories' are capable of storing millions of data (on magnetic drums, or on special matrices of electric wires and magnetic beads woven like sheets of cloth). The demand for greater and greater data-storage capacity is never-ending for, as we have argued already in connexion with other 'informational services', their potential value is measured by the amount of information which they are capable of handling in their operations.

This brings us to the next point—the *accessibility* of information stores. In the filing systems of large industrial undertakings, public utilities, government offices, ministries, libraries, techniques of storage have needed to be improved to cope with the ever-expanding quantities of data; techniques such as micro-filming and magnetic-tape recording. Storing the data is one thing, but finding any wanted item on each occasion is another.

One result of this trend has been increasing research into what is called 'documentation study'; in classification systems, in improved library indexing and classification (especially of scientific material), in study of efficient coding systems for our telecommunication channels as well as for our punched-card filing systems and, as we shall discuss later, in the development of the logical and mathematical 'Theory of Information' which represents the fundamental aspects of all means of communication and storing data.

In summary, we have argued here that the capital investment of a society in its telecommunication equipment and in all its means of 'clerical' automation represents one measure of the degree of 'social integration'; further, that since every one of these technical systems has a finite capacity for information, this capital represents the potential economic value of this information to the society.

The key word is *information*: let us examine this term a little.

Semiotic or the 'Theory of Signs'

In his *Essay Concerning Human Understanding* John Locke divided all that can fall within the compass of human understanding into three categories.² The first he called *Physica*: ("... the knowledge of things as they are in their own proper beings, their constitutions, properties and operations . . ."). The second *Practica*: ("... the skill of right applying our own powers and actions for the attainment of things good and useful . . ."). The third *Semiotica*: ("the doctrine of signs . . . to consider the nature of signs the mind makes use of for the understanding of things, or conveying its knowledge to others . . .").

² 1689. See Book IV, Chapter XXI.

Semiotic, the theory of signs, is a branch of epistemology, the theory of knowledge. All communicable knowledge is expressible in signs. The signs themselves may take any physical forms, which we transmit or pass to one another, and the knowledge communicated is inherent in these signs.

The term '*sign*' is a wide one. It covers all human language, all gestures, all *ikons*—or pictures and diagrams, all *tokens* (like money, hat-checks, birth certificates, and other documents) which are used as object-substitutes for exchange, all cultural symbols in which are embodied the history and traditions of a people (e.g. the Cross, heraldic crests, architectural motifs, some ancient social customs like hand-shakes, uniforms, the names of people—an infinite host which surrounds us every moment of the day). Signs are the elements by which we construct and manipulate our thoughts and commune one with another; they are the bricks of the house of knowledge.

In an earlier paragraph emphasis has been laid upon *information* and on its value to society. Now information, in this technical sense of punched holes in cards, or in electrical signals, or marks on paper, may seem to the reader an empty and sterile thing. What, you may ask, of all the cultural aspects, the meaning, the truth and worth of all the messages and documents, the books and records of a society? How about all this human background which is implied when the term '*information*' is used in everyday life?

We must make a sharp and clear distinction between the signs themselves and the people who use them, because their worth, or their truth, their meaning or their purpose exist in their *relationship* to their human users. It is helpful, perhaps, to distinguish three categories of all situations in which signs are used:

(a) *The 'syntactic' level.* This concerns the signs themselves and rules by which they are ordered—e.g. the rule of spelling or of grammar, the rules of arithmetic, or of an index or filing system.

(b) *The 'semantic' level.* This concerns all relationships between signs and their designata (by which is meant, roughly speaking, "what the signs symbolize or portray or represent").

(c) *The 'pragmatic' level.* At this level we discuss all questions of relations between signs and specific users—those who utter them or receive them. To this level we may relegate all matters of purpose, or value, or personal significance.

These three levels are not so clear and distinct as such simple definitions might suggest, but perhaps they help to clarify our present discussion. All three levels refer to signs; our telecommunication networks, our libraries, our clerical and documentation systems, and all these technological aids deal with nothing but signs. A telephone

line, for example, transmits only signs; it cannot be said to transmit meaning, or truth, or significance, for these depend entirely upon who is listening; they are pragmatic factors. The conversations may be on momentous affairs or may be trivial gossip; the telephone is available for either.

The Theory of Information

There has developed during the past ten years a whole mathematical theory around this concept of *information*, which has crystallized from the intense activity in telecommunication and in other related sciences during the past thirty years. We need not enter into the details of this theory here, but we might emphasize certain of its points significant to our present arguments.

Let us consider for a moment any situation in which we might 'seek information'—e.g. when we go to a file, or answer the telephone, or look up a reference, or read a book.

Information can be received only where there is doubt; and doubt is always about *alternatives*. We can only doubt *whether* A or B, or doubt *if* something is or is not the case. With our concentration here upon signs, we can say that information can be obtained from a source by virtue of its removing our prior doubts about what signs it contains. Our doubts are reduced from an initial state before to a final state after we went to the source of information.

To take a simple example; imagine yourself watching a teleprinter machine typing out the letters of a message on to paper, one at a time. Before each letter is typed you are only in a state of partial doubt about what will appear; thus you will know it will be one of the letters of the alphabet, or a numeral, or punctuation mark. This is partial knowledge; when the letter is printed only the remaining doubt, as to *which*, is removed. 'Information', then, in this syntactic sense, gives the power to select signs from an alphabet or, more generally, from a set or ensemble of alternative possible signs.

One further and important point. The signs in any alphabet or ensemble are not equally likely to occur. For example, in the English written language the letter E occurs most often and the letter Z least often. Hence, before a letter is printed by your teleprinter, which we are imagining, your expectancy concerning E is greatest, of all the alphabet, and is graded over all the other printed signs according to their probabilities. Thus the information contributed by any letter of the alphabet depends upon its probability. Such probabilities, being your 'expectancies', form part of your existing, or prior, knowledge.

There is a further complication in this example arising from the rules of spelling. If you have received part of a message, you know some-

thing also of what is to come; in fact, you might guess part of the remainder quite accurately. This property of nearly all messages is called *redundancy*, being a rather misleading name for a property of language and of nearly all other sign-systems used by human beings. When you speak on the telephone or read a book you have *some* knowledge of what is yet to be heard or seen, the words convey information only because they change your predictions or 'expectancies' concerning these future events.

In the various technological means for transmitting or storing information, such 'redundancy' makes extra demands upon the capacity. It is not surprising, then, that with the increasing pressure upon all our informational services, research is being undertaken into ways of reducing the redundancy in signals automatically—in telephone systems, in telegraph and television channels, and in all forms of data transmission and storage.

Information Theory is a rigorous mathematical discipline. It arose within telecommunication—which to this writer is a social science—it takes into account various intuitive ideas we all have about signs and language. Since the theory was evolved it has aroused interest among students of several other social sciences; for instance, linguistics, psychology, economics, ecology—not surprisingly—because of the universal implications of the concept of *information*. The social sciences, compared with the physical, are starved of exact method; can Information Theory help supply the need?

Application to the Social Sciences

Telecommunication is not purely a technological study, but part of social science. Telephones do not communicate; people communicate, one with another. In the writer's opinion, telecommunication science is not an intelligible study if restricted to the technological level, but only if we also consider the human users.

The theoretical and mathematical work which has developed within telecommunication is making some contribution to certain social studies. Information Theory especially is suggesting method and is supplying numerical measures where before there was only descriptive treatment. We shall conclude this article by a bare reference to some of these contributions, in order to show the interests and their future trends.

Unto what is society like? Herbert Spencer compared it to the animal body, with its various institutions likened to the internal organs (the heart, the nervous system, bowels, etc.). But this was only an analogy and not what we would nowadays call a 'scientific model';

for we cannot *do* anything with it, not infer any conclusions nor make predictions for our future guidance.

There are few to-day who would pretend to set up comprehensive models of society. For there are many aspects, many levels, so perhaps we need correspondingly many models. For society is then not one concept, but a collection of many. Thus if we were to describe an army (a clearly-formulated, rigidly organized, closed social-system, artificially constructed for restricted purposes rather than freely grown), we would describe its hierarchy of command, or its function (as tactics and strategy), or its supply system; or again, its traditions (uniforms, customs, and symbols); or its peculiar language, its slang and technical jargon—and each category could require a distinct form of description.

It is in a very modest sense that Information Theory is making its contribution to certain specialized fields; we shall mention a few.

Speech, Hearing, and Linguistics

Relevant to the field of human language, there have been two major areas of development fertilized by telecommunication and Information Theory. The first is the physical processes of speech and hearing; the second is the extended application of statistical methods to linguistic analysis.

The urgent need to make more economical use of our telecommunication channel capacity has forced a greatly revived interest in speech and hearing. Classical phonetics had relied to a major extent upon the trained ear of the phonetician, who listened critically and recorded the speech sounds in his peculiar writing. In recent years there have been many attempts at improving the precision of this process by instrumental means. One main-spring of this work is the desire to produce 'compressed' telephony channels in which are transmitted, not the whole speech sounds, but only those which are significant to the brain of the listener. This work immediately highlights our ignorance of the speech-hearing process.

Research in this field has been concentrated on measuring and specifying the sounds of speech, in various accents (for no two people speak exactly alike), by instruments, together with studies of how the brain recognizes these infinitely varied speech sounds.

Turning to linguistic analysis, statistical studies are far from being new, though they have been greatly elaborated recently. Even in the fourteenth century it was realized that words and letters were not used equally often in a language and that this fact was of use in decipherment of secret messages. (The first count of letter frequencies was probably made by Siculo Simonetta of Milan in the year 1380.)

The words in written language vary widely in length, for it is a fact, not surprisingly, that human laziness should force words to become shorter as they come into more frequent use. The precise statistical law of this and various other relationships is found by the patient counting of thousands of pages of print; in newspapers, in novels, in classical texts; from the writings of this and of earlier centuries and of many countries and languages. To-day we know fairly accurately how often any letter or word occurs, or how often any one follows any other. And the surprising thing is the regularity of the laws found among various languages and in various historical times. It would appear that human beings are not 'free' to use their language as they like, but operate under a set of constraints, determined by the effort required to say or write anything and the length of time it takes to do it; the laws represent various forms of economy.

Recent contributions to this field of 'statistical linguistics' have aimed at theoretical analysis and mathematical explanation of these various language economy laws, and the methods used are those of Information Theory.

Group Networks. The Flow of Messages and Social Structure

The structure of a human social group does not conform to a single hierarchy, but contains numerous overlaid hierarchies. The whole structure is too complex for reliable analysis. In recent years two particular approaches have been made towards understanding how human societies develop structure; both form very modest first steps, and both emphasize the *message* or *information* background to social relationships.

The first approach is to study some selected industrial organization, a major factory or office, and to observe the flow of messages of all kinds, telephonic or written; to observe their natures, their purposes and results, and between what persons or departments they pass. Now an industry is a fairly well bounded, ordered society, having specific purpose, whilst its members are supposed to have limited, specific functions. We have all seen, hanging on the walls of director's offices and boardrooms, those neat charts with little rectangles labelled 'managing director', 'sales manager', 'advertising manager', etc., connected by lines showing their supposed relations. But the true flow of messages suggests that frequently the real operating relationships are quite otherwise; the real structure which emerges can be very different from that invented by the board of directors, being dictated not by any one person's will but by various laws of human economy, and by personal friendships and the maintenance of morale and goodwill.

The second approach is synthetic, not analytic. In this a small group of people are set in a laboratory to solve some well-defined problem or puzzle of such a nature that all of them become involved. They may also be put into specially prepared adjacent cubicles, able to write and pass messages one to another through windows. The nature, length, and frequency, etc., of all their messages is observed, and from this data the pattern of the social structure which develops is assessed. It is largely the relation between the pattern which grows and the nature of the task or problem which is of interest.

Again, with such simple conditions it is possible to apply mathematical analysis, and if this work does nothing else it may at least expose such fields of analysis as may eventually lead to better understanding of real human societies and their growth.

The Laws of Economics

A major part of national budgeting and other economic action is made by the judgment of people of very great financial experience; though empiricism and not scientific law is largely the governor. But the basic elements of the production and distribution of wealth are not mystical, being open to scientific inquiry.

In recent years, great promise has been shown to the development of economic theory by a scientific principle called the *principle of feedback*. Again, this had its roots in the application of mathematics to the study of telephony in the 1930's. Briefly, 'feedback' means the following: if a certain action is taken which has a certain result, and if this result departs slightly from some desired result, the difference is observed and caused to modify (feedback to) the initiating action by a suitable correction.

The mathematical theory of feedback is very sophisticated, but it has exposed a number of concepts and principles which are absolutely universal and inescapable which relate to the notions of *stability* and *instability*—for example, economic booms and slumps. It was J. M. Keynes who first applied the feedback principle to economics, and whose theory affected the economic policy of F. D. Roosevelt.

Since his day the whole theory has been very greatly elaborated and confirmed by experience. The essential relationships between capital, rates of interest, rates of investment, wages, and the other economic parameters are so much better understood to-day.³ Here, then, is another branch of social science which has been assisted by the mathematical concepts of telecommunication.

³ e.g., see A. Tustin, *The Mechanism of Economics* (William Heinemann, London, 1954). See also the Earl of Halsbury, "Automation—Verbal Fiction, Psychological Reality", *Impact* (Vol. VII, No. 4, Dec. 1956), p. 179.

Man as Giver and Receiver of Information

We have here adopted the view that a group of men and women only becomes a society by virtue of their communings, above all, by exchange of signs. It is then not without sociological interest to draw attention to the use of Information Theory for measuring the rates at which human beings can exchange information.

As we saw earlier, information can be measured by the rate at which selections can be made from a set of alternatives. Experimental psychologists have measured how rapidly people can make elementary selections in performing numerous, well-defined, selective tasks, as in typewriting (selecting keys), or piano playing (selecting notes), and others. In all these cases the rates are approximately the same; it turns out that none of us can make selections at rates greater than, very roughly, one choice out of ten alternatives six to eight times per second—a most surprisingly low rate of information.

Low compared with what? Compared, in fact, with the rates in which stimuli provide information to our sense organs; our ears, eyes, and skin. The sights and sounds which reach us present us with millions of alternatives to choose from every second. We receive so much, then, but respond with so little.

In the words of the psychologist, Professor George Miller of Harvard, "Man is not a communication channel, he is a bottleneck."

Once again it should be stressed that this way of measuring human information rates is the fundamental, quantitative, scientific way. It may seem to some readers to conflict with their intuitive notions of human exchanges of information, and seem cold and empty. This is because of the ease with which we confuse information, *per se*, with its value, its purpose, its meaning, its truth, and a host of other semantic-pragmatic properties. The information itself must come first; all these other properties stem from it and its human user.

These few examples which have been cited may seem trivial to many readers. But in the social sciences we are in no position to despise the simple and apparently trivial if we hope to evolve methods such as have given exactness to the physical sciences. Above all this exactness rests upon the use of mathematics, and it is for the basic mathematical techniques that we are fumbling and groping in our darkness. Only with these can *science* light the house in which human beings may live with one another.

COLIN CHERRY.

*Problems of Misunderstanding—Mechanical Aids
to Technical Presentation*

ANY motorist who inquires for his hotel in a strange town is likely to receive a practical illustration of the bewildering inaccuracies which beset the communication of precise data between strangers. Accurate communication is rare except between old friends discussing simple questions of mutual interest. One sphere of activity in which the errors of transmission may mask the message completely lies in presenting new knowledge to engineers. A few years ago the writer became involved in presenting the principles of designing equipment for drying solids to the technical staff of a large industrial concern.

A Situation in Industry

In order to maintain its competitive position, a factory which already has an established market in drying equipment must concern itself with information from sources such as the technical literature, reports about previous installations, patents, novelties, from the financial Press, etc. The technical staff who are responsible for development are busy, practical men unaccustomed to obtaining information by reading and mistrustful of facts which they cannot check. Most of the driers ordered are expected to handle substances with characteristics unknown to them; the resultant dilemmas are met by increased expense or by taking a risk. This is understandable when the life of projects is too brief to encourage alternatives, such as seeking further information from books or experiments and persuading one's colleagues to accept the results. Two or three members of the design staff confronted with such a situation would probably welcome a meeting with an expert who could deliver a short illustrated lecture on the aspects of drying relevant to their problem. Unfortunately lecturers of this calibre are rare, and in any case would require some weeks' notice to fulfil the highly specialized requirements of their audience, so that their assistance would not be available in time. However, the technique of preparing a lantern lecture is quite well known, so that it is straightforward and not very expensive to mechanize the lecture and to convey the message by three channels:

- (a) By speech recorded on a magnetic tape or gramophone record;
- (b) by the same message in typescript;
- (c) by a series of diagrams to illustrate each point.

A more vivid impression of the subject-matter is often obtained by using sight and hearing together instead of singly, so that information is addressed both to the eye and to the ear. The effectiveness of mechanical lectures is assisted by adopting a two-stage method of presentation:

- (a) A pictorial description of the mechanism, using diagrams;
- (b) formulae, charts, and nomograms to assist extrapolation.

The cost of staff time to prepare a lecture would be about £300¹: for an extra £30, say, it should be possible to deposit five copies of each mechanical lecture in the firm's library so that they could be issued like books for consultation whenever the occasion arose.

Experiences with Mechanical Lectures

During the last few years the writer had experience of this novel system for disseminating technical information in a large works. For many years considerable difficulty and expense had been encountered in the operation of drying equipment, and it was found that:

- (a) The performance of installed equipment bore little relation to its manufacturer's assurances;
- (b) the literature on the subject was vague, voluminous, and often conflicting;
- (c) there was no accepted yardstick for correlating the results of experimental observations.

A committee set up to study the question met to study reports thereon four times a year for five years, but were unable to agree on a technical basis for assessing laboratory experiments. Two mechanical lectures were then prepared in order to resolve this controversy.

Lecture 1—On the behaviour of liquid films on the surface of drying particles which affects their handling as well as their drying properties.

Lecture 2—On the transfer of heat from hot gases to the surface of the drying solids.

The lectures were issued to the committee, read aloud and discussed at a meeting held a month later, when the conclusions were accepted by the committee, and in a year spread through the organization. However, it is not clear from this experience that the mechanical lecture is markedly superior to a lantern lecture. An objective comparison is impracticable on account of our ignorance of the processes of the brain; however the following section attempts to compare the merits of various systems of communication by empirical methods.

¹ £1 = 2.80 dollars.

Coefficient of Misunderstanding

There are several ways of communicating information from one person (the transmitter) to another (the recipient); common instances are speech and hearing, writing and reading, drawing and looking. When such systems use a single pair of senses they are called channels of communication; combinations of channels are called systems. All practical systems of communication, e.g. telephoning, are handicapped by misunderstanding.

Let the fraction M = Coefficient of misunderstanding for any system.

Then conception X in the brain of the transmitter will become conception $(1 \pm M)X$ in the brain of the recipient.

When $M \rightarrow 1$ the message received will bear little relation to that transmitted.

It is considered that :

(i) If transmitted N times from one individual to the next, conception X will become conception $(1 + M)^N X$.

(ii) If repeated N times between the same pair of individuals, conception X will be received finally as conception $(1 + M)^{1/N} X$.

Rumour exaggerates inaccuracies and checking back reduces them, so that it would appear that M is rarely less than 0.1, usually less than 0.5, and normally about to 0.25.²

As interest centres on the system of transmission, it will be assumed that M is a function of the system and is averaged over different levels of intelligence, ideas transmitted, etc.

Single Channels

Table I discusses communication by the primary methods in normal use, viz. speech, writing, and pictures.

TABLE I

CHANNELS FOR COMMUNICATING A CONCEPT BETWEEN TWO PERSONS

(a) COMMUNICATION BY SPEECH

<i>Transmission</i>	<i>Communication</i>		<i>Reception</i>
Brain A . . . Conception X .	Converted into speech = sequence of sounds produced by the larynx	Sequence of sounds received by ear-drum	Brain B Conception $(1 \pm M_1) X$

² These values are not inconsistent with observations such as: News which has suffered many transmissions need not be discounted completely. A minimum accuracy of about 10 per cent is imposed on all communications because the transmitter never knows all the truth.

Memory is the only record of the operation, which occupies only a few seconds. There can be large errors both in converting the conception into sounds and in the impression received, so that a single statement by a stranger may be unintelligible—i.e. $M_1 = 1$. Cross-checking by question and answer can greatly reduce M ; errors in reception can be reduced by continuously sustained attention; gestures and vocal inflexion reduce the errors in transmission; it may be observed that these advantages are largely lost under the conditions of telephonic communication.

(b) COMMUNICATION BY WRITING

<i>Transmission</i>	<i>Communication</i>		<i>Reception</i>
Brain A . . . Conception X . .	Converted by hand into script = sequence of symbols on paper	Image of sequence of symbols received on retina	Brain B Conception ($1 \pm M_2$) X

Writing is an unrivalled medium for all sorts of mathematical exposition. Written records are permanent in comparison to speech, and lend themselves to more careful preparation, so that the transmission errors are smaller. The errors in reception are large because of the prevalence of skimming; this may be exacerbated by the labour of interpreting an artificial cypher with no indication of emphasis.

(c) COMMUNICATION BY PICTURES AND DIAGRAMS

<i>Transmission</i>	<i>Communication</i>		<i>Reception</i>
Brain A . . . Conception X . .	Picture or diagram drawn on paper or copy projected on screen	Image received on retina	Brain B Conception ($1 \pm M_3$) X

Pictures, as a means of communication, have long since been superseded by writing; nevertheless they are exceedingly useful for illustrating situations which cannot be described simply by ordinary language, either in speech or writing.

Channels in Parallel

Errors of communication can be much reduced by simultaneous use of more than one channel of communication (e.g. eyes and ears), to receive messages and by checking back. The following list of com-

binations is far from complete and indicates the considerable experience available in this field.

TABLE II
FAMILIAR SYSTEMS OF COMMUNICATION

No.	Description of Method		Remarks	Approximate Coeff. of Mis- understanding M for a Single Transmission
	Transmitting Agency	Faculties used for Receiving		
1	Verbal dis- cussion of visible object	Hearing and vision	In general use for disseminat- ing information by countless generations of men Recapitulation helps to reduce the misunderstandings of conversation by acting as a feed-back control	M = 0.2 M = 0.1
2	Illustrated book	Interrupted vision	Permanent record; indispens- able for mathematics; lends itself to checking back	M = 0.3
3	Lantern lecture	Hearing and vision	A mechanized approach to (1)	M = 0.25
4	Silent film with captions	Interrupted vision	Portrays motion and is subject to the limitations suffered by deaf people	M = 0.3
5	Talkies and television	Hearing and vision	A close mechanical parallel to (1)	M = 0.25 +
6	Gramophone, wireless, and tape recorder	Speech only	Subject to the limitations suffered by the blind	M = 0.4

The numerical values of M merely codify a rough correlation of everyday experience. They indicate that good communication corresponds to values of M less than 0.2. Values greater than 0.3 indicate poor communication.

In life we use every available sense with advantage to sharpen the perception of our surroundings. The same principle seems to apply in mechanical systems of communication; it implies that a talkie film with captions could be a powerful instrument for delivering a technical lecture. Experience supports the suggestion and has also indicated that the complicated organization for recording a good talkie may cost in Britain £5,000 for a twenty-minute lecture. It would be possible to deliver a twenty-minute lantern lecture with a slide every two minutes for less than one per cent of this sum; furthermore, the lantern lecture lends itself to technical subject-matter because each

successive link in the chain of reasoning can be made the subject of a slide; there will not be many lectures which warrant the expense of a talkie on account of its somewhat greater accuracy.

An even smaller coefficient of error is likely to result when mechanical speech is accompanied by an illustrated script: this system lends itself to recapitulation and discussion which still further reduces the errors of communication, especially with small audiences.

Discussion

Junior members of the Technical staff of a large Company engaged on a wide variety of projects often require expert advice, which could be transmitted to their eyes and ears simultaneously without special equipment by reading aloud to an audience, who followed the message by gazing at an identical illustrated script. As this procedure would be rarely convenient, mechanical lectures could be substituted and made available from a library, like books. The following equipment should suffice to deliver a thirty-minute lecture to a small audience:

- (i) One illustrated typescript for each member of the audience.
- (ii) A gramophone and a record of the script.

The audience would then follow the record by reading the script; the record would be stopped to examine illustrations; it would also be restarted to assist recapitulation on discussion.

The cost in pounds sterling of converting a report into a mechanical lecture can be outlined as follows:

<i>Description of Operation</i>	<i>Cost</i>	<i>Remarks</i>
Staff time occupied in writing the lecture and preparing rough diagrams in a form which can be approved if acceptable	£300	The cost of visualization influences both the diagrams and the text; it will sometimes be economical to hire the services of firms skilled in the preparation of filmstrip Six copies bound and filed for issue as required
Typing eight pages	£30	
Tracing fifteen diagrams	£30	The cost of making the master pressing will be £30; subsequent pressings will be about 30s. each
Gramophone	£33	
Long-playing record		
TOTAL	£393	

Excluding the capital cost of visual presentation and the initial cost of the gramophone, the cost of a mechanical lecture will be less than 10 per cent of this total, i.e. about the cost of a long-playing record.

By spending an hour or two playing the lecture through and checking doubtful points it should be possible to reduce the coefficient of misunderstanding to 0.1-0.2, an accuracy comparable to that of discussing reality by conversation.

It cannot be claimed that the foregoing system of presentation offers the highest accuracy for the least cost under all circumstances, but it can be shown to compare favourably with the following alternatives in the field of engineering.

Films are very expensive and offer little advantage over static illustrations.

A carefully prepared, well-illustrated document presented without sound would probably be as effective as an inferior document with a gramophone accompaniment. However, the cost of visualization is about ten times that of providing the record; the policy of economizing on sound appears to be improvident.

Filmstrip Projected on a Screen

This could be used for large audiences, the extra expense being:

Fifteen pictures at £1 each	£15
Screen	£10
Projector	£20
	<hr/>
	£45
	<hr/>

This is a variant of the lantern lecture technique in which the errors will be greater than in mechanical lectures because the audience must forego the assistance of following the lecture in the script, or else their attention is distracted by looking alternately at the screen and the script.

Substitution of a Tape Record for a Gramophone

The initial expense of making a pressing is avoided when the lecture is recorded on a tape instead of on a disc. However, the tape recorder costs twice as much as the gramophone; the tapes are difficult to duplicate and liable to damage. Moreover, the operation of a tape recorder demands experience or practice whereas anyone can play a gramophone.

Conclusions

The subject-matter of engineering information often concerns complex questions, such as combinations of flow and other changes in three-dimensional structures as well as economic complications, whose

presentation is assisted by visual methods. It is not expensive to convert a visualized document into a mechanical lecture which lends itself to feeding mechanical information to junior engineers engaged in handling a variety of projects; the available evidence indicates that mechanical lectures are likely to prove popular in their limited field. Improved methods of communication are important in other fields of activity, so that there may be room for experimenting with mechanical lectures; in any case, the sort of reasoning which underlies their application to disseminating engineering information in industry might help in selecting combinations of channels suitable for communication in other walks of life.

W. F. CAREY.

Mass Media and the Pupil-Teacher Relationship

FOR a long time now the triple foci of attention in the classroom, as far as the pupils are concerned, have been the teacher, the blackboard, and the book. We may include with the blackboard the wall picture or chart, though the difference between these (which are themselves meant to be visual aids) and the blackboard (which is simply a 'carrier' for visual aids, whether drawn or fastened) is obvious enough. The 'book' can include printed and duplicated material of all kinds, including maps and diagrams—anything sufficiently small for the children to use individually and have in front of them on their desks.

It is true that the eye has been free to roam, and might settle on something of greater interest outside the classroom (if the windows are not too high) or on ceiling or floor; it might also obstinately focus on the teacher's tiepin or collar, on cracks and lines—'very like a whale'—on the blackboard's surface, or on fascinating *graffiti* in the margin of a dog-eared book. The three foci of blackboard, book, and teacher—the one animate and the two inanimate—have remained, however, the chief visible sources of understanding and bewilderment, of irritation, unhappiness and delight. Moreover, it has been these three only to which hitherto it was legitimate to attend.

In this situation there has not, as a general rule, been anybody at the teacher's elbow—unless it were the head teacher who occasionally popped in, the inspector's visits being too infrequent to be counted. From the pupil's viewpoint it seemed that the teacher taught alone, deferring to no one else's knowledge. For many pupils—in particular those from homes where books and discussion are unfamiliar—he or she has appeared to be almost the sole giver of knowledge, reigning supreme over his little kingdom of minds, like Goldsmith's village schoolmaster—"... and still the wonder grew that one small head could carry all he knew". Numerous other pupils have derived much from books and out-of-school activities, and yet are aware of owing most to a classroom teacher's personal influence and teaching.

On the whole the relationship between teacher and pupil has been a 'face-to-face' one, suggesting, perhaps inevitably, a measure of antagonism. Generally the teacher has confronted the class and has been alone with it. Only textbooks and wall pictures have, to some extent, obliged the teacher to adopt the pupils' physical viewpoint;

and the teacher often has a considerable say in the choice of such media, which vary in content and way of presentation. On the other hand, he may have got his own knowledge from the very textbook being used, and may even have done so a step or two in advance of the pupils. But if he should lean somewhat heavily on the textbook or on other material designed for the pupils' use, the fact may not be unduly apparent.

Clearly there are 'background' teachers; teaching is not a solitary enterprise, whatever the pupils may think and even if occasionally a teacher thinks likewise. The syllabus is often, and the textbook course is usually, not written by the teachers whose teaching they guide: the authors of such aids are, in effect, teaching via the classroom teacher, who may possibly misuse the material and advice given or, alternatively, improve on it. The teacher sometimes exercises an influence, however, by writing the syllabus himself, and may help to choose the books. In any event the number of 'background' teachers of a single school subject has generally been fairly small.

In the traditional classroom setting, established many decades ago, another legitimate focus of the pupil's attention may, of course, be another pupil saying or doing something the teacher wishes him to say or do, such as answering a question or writing on the blackboard. With the growth of 'pupil activity', seen as a necessary element of learning, this focus has come more frequently into play. Yet the teacher, and the blackboard which he controls, and the books which he appears to dominate, remain the primary foci, to which 'pupil activity' is often related.

The foci merge and separate, but usually it has been the teacher who directs the pupils' attention—now to himself and the board at which he is pointing, now to the board alone, now to the book in which he indicates something, now to himself and a pupil or group of pupils, and so on. But, like a ship's captain, he does sometimes leave the bridge, the area in front of the class which is habitually his base of operations—shall we perhaps say his stamping-ground—and takes a walk round the classroom, thus occasionally seeing the classroom set-up from the pupil's point of view. (We have not in mind here, of course, the good infant school classroom, or indeed any classroom where what we call 'activities' are in progress and where both teacher and children move freely about; our references are to post-infant classes run along fairly traditional lines and something of what we have to say applies also to adult classes, though doubtless with less force.)

So much for the pupils. The teacher's own attention has been directed mainly towards the pupils themselves, and for him there are

not three foci, but as many as the number of children in the class. This is true, at least, of the competent and well-prepared teacher, as independent as may reasonably be expected (that is to say, not wholly independent) of textbook or wall charts or teaching-notes. For the teacher the blackboard is rarely, and should not be, the main focus of interest even when a pupil is writing on it.

The Ephemeral Nature of Oral Exchanges

Still another thing has characterized the pupil-teacher relationship until very recent times, and that is the extreme impermanence of oral exchanges. Written work could be preserved, oral work could not—and yet there might be reasons as good or better for preserving it; one thinks of play readings, language drills, lecturettes, ceremonies, even the working out of mathematical problems. Teachers' and pupils' words alike were gone with the wind as soon as uttered. This has meant, among other things, that everything out of the year's work and activity which could be 'recovered' and of which a clear view in retrospect could be obtained has had a bookish flavour, and that almost inevitably a higher value has been set on what is written than on what is spoken, since the former is the vehicle of tests and exercises which must be kept. It has also meant that criticism of oral performance has had to be based on the single speech-act, and could not avail itself of recapitulation, so necessary if untrained pupils are to observe good and bad points for themselves. Nor was there the additional means of heightening interest which the possibility of recording affords, nor the chance of linking lesson to lesson orally as well as by reference to what had been written or read.

The arrival in the classroom of modern audio-visual apparatus has modified the pupil-teacher relationship in a number of ways. Changes have come about almost imperceptibly and as part of much bigger changes in social life and in education; such, for instance, as have resulted from the accounts of human nature which psychologists have given, from the decay of institutional religion and from the higher status which the teaching profession has achieved.

For the pupils of to-day, at least in countries where mass media are generally used, the legitimate foci of attention have become more numerous. There is not only the teacher, the blackboard (or a picture) and the book; there is also the gramophone to attend to, the tape recorder, the film or filmstrip on the screen, the radio or television set. As a school acquisition, some of this apparatus still has the charm of novelty and, indeed, the prestige (one can think of no better word) which modern inventions carry in the eyes of many of the young.

The different foci of this sort, old and new, to which pupils in a well-

equipped classroom may now be required to attend is, therefore, roughly as follows (where A stands for auditory content, V for visual, AV for both):

	Blackboard (V)		TEACHER (AV)
Gramophone (A)		Tape recorder (A)	
	Books, etc. (V)	Filmstrip (V)	
	Film (AV)	Television (AV)	

This is, of course, a simplification, ignoring ways in which the media may be combined: thus, the tape recorder can be used simultaneously with filmstrip, the gramophone and film may supply material to the tape recorder, television may transmit films. The simplification does not seriously falsify the picture if we bear in mind that filmstrip may have an auditory accompaniment and that auditory material presented through one medium may be transferred to another.

Knowledge and stimulus are thus brought to the present-day pupil, at least in technically favoured areas and schools, through a larger number of channels, most of which are familiar in everyday life. The radio, and now television, are household furniture; the gramophone is also common; the cinema is a feature of the general scene. Even tape recorders and film projectors are commonly to be observed in shop windows. Books, now so widely disseminated, were for long associated with centres of learning, but this is not true of the modern aids which, on the whole, first established themselves outside the school, as a means of entertainment, before they were used in education. Inevitably therefore pupils tend not to think of such media as altogether characteristic of school life, but rather as a welcome invasion of school life by the up-to-date and science-fashioned world lying beyond it. These things, it is clear to them, are not wholly of the school and of the teacher, though the school acquires them and the teacher switches them on and off. The pupils watch and listen-in outside the school, and much of their knowledge of the world, and more of their impressions of it, derive from the general use of the new media which the school shares with the community at large.

Change in the Pupil-Teacher Relationship

This situation has subtly changed the pupil-teacher relationship, even in junior classes. That the teacher is not the only source of information

is fairly obvious to his pupils. It is true that the most advanced of these could always 'escape' from the teacher into books, although the teacher has very long been established in people's minds as a 'booky' person, entitled and expected to advise on books and with a strong tendency to equate learning with book learning. But nowadays there may be several teachers standing, so to speak, at the classroom teacher's elbow, when gramophone or radio or television are regularly used in teaching, and standing there rather more conspicuously than the authors of a textbook course. To these 'background', or we might say 'secondary', teachers the classroom teacher will be inclined, generally speaking, to defer, though for his part perhaps inconspicuously. Apart from any glamour they possess, as minor or major 'stars' of the new media (figures which appear always in a friendly light and never come out from box or screen to check or interfere), they are in fact models of how something should be done or authorities on some branch of knowledge—and are regarded as such. They are models and authorities, that is to say, by comparison with the ordinary classroom teacher. The pupils are shown the way to sing or dance or pronounce or solder a joint or catch butterflies (and that has not necessarily been the teacher's way, if the teacher has had a way at all), and obvious experts, men and women often who do not look like teachers, give information about distant places and people which the teacher, as the pupils realize, could not possibly give.

As a result of these modern developments the classroom teacher is less alone, as guide and example, with his pupils, and they are less alone with him. 'Background' teachers are not only more numerous than they used to be, but they have greater prestige; and with them, in planning his work and giving his lessons, the classroom teacher often has to co-operate, though it is normally a one-sided co-operation. It would doubtless be untrue to say that the classroom teacher is regarded with diminished respect as a result, but at least the pupils do not need to hang so exclusively on his words and actions, nor can he nowadays so easily lay claim to knowledge he does not possess; there are more occasions, both inside and outside school, on which the pretence might be blown sky-high.

Bringing in specialists via the new media, the classroom teacher is forced back upon the pupils' viewpoint in more than one sense. To some extent he may be learning with the pupils, whether at the moment the 'background' teachers' material is in play or not (for 'Notes' may have reached him earlier), and he may witness this material (perhaps a lesson on badgers, which he has never seen) in much the same light as they do. And he is obliged also to adopt a similar physical viewpoint. Education becomes a co-operative affair, not only in the sense

that more people, including the classroom teacher, are involved in instruction—people to whom that teacher almost necessarily defers (though he may have some slight choice of who to defer to)—but also in the quite different sense that teacher and pupil may to some extent be associated in learning.

The 'face-to-face' setting is, indeed, much less normal than it once was, even in senior classes. Using the visual aids, the teacher is bound to look, not at the pupils, but with them at something else, and may often be seated among them. The suggestion will thus be strengthened in the pupils' eyes that the teacher is in some manner and to some degree a pupil himself. At best he will prepare the class competently for the broadcast lesson or whatever it is, answering questions and giving additional information afterwards in such a way as to make clear that he, too, knows much about the subject. At worst he will come to be looked upon as little more than a switcher-on and switcher-off; it is the general-subjects teacher, unable to compete with specialists because of the breadth of his task, who is most likely to find himself in this position. The mere possibility is an argument against non-specialization.

The aids differ considerably from one another in the extent to which a teacher can weave their content into his own plans or adapt those plans to suit the content. His own activity may be marginal, if intelligently and constructively so, or the content itself may be marginal to his activity. The material cannot be changed—records, filmstrip, film, radio, and television programmes—all these have to be accepted as given; they come from outside and the teacher has played no part in making them, though he may have exercised choice. Only the tape recorder is entirely at the teacher's service, the tapes being (at present) blank, for him to put there what he will. But the tape recorder can readily be used in conjunction with other media; recordings can be made of records, broadcasts, and the sound-tracks of films, the advantages being several—repetitions can be had indefinitely and of any passages, the recording can be edited, it can be used at any time, it can be used for re-recording. Equipped with a tape recorder, the teacher who feels himself developing into something like a midwife of what the aids can deliver comes once more into his own. There is choice, one might think, of records and filmstrip and film, except where locally available stock is small (not that this is an unusual situation). Yet when it comes to finding material for a particular purpose, choice is often severely restricted. No doubt there are three different versions of Tennyson's 'Maud'—but will there be more than one good film about the world's climates? There will be filmstrips about American history, but will there be more than one about the background of the Civil War? As for a radio series on famous explorers, or on key ideas in

modern science, the classroom teacher has to take them or leave them just as they are.

The Teacher's Commitment to His Aids

The teacher committed to the regular use of certain mass media is thus committed to a great deal, and the nature of the commitment markedly affects relations with the pupils. Unless the pupils are very young indeed, they will be aware, even if dimly aware, that much of what they learn at school comes from outside. Their attention will often and vividly be called to the existence of this outside world as a place where knowledge and experience is to be gained. The teacher is seen to be sometimes a co-learner, and is plainly not the ultimate authority on what, how, or why; he may or may not 'know the answers'. From the teacher's viewpoint—and this applies even to quite competent teachers when handling matters on which they are not fully expert (that is, to the majority of teachers)—the extent to which, on the other hand, the pupils may 'know the answers' can be surprising. Children are much better informed, though of course patchily and often very inaccurately, than they once were, largely because a great deal more information and many more impressions reach them through mass media, chiefly at home and at the cinema, from the outside world, the world that lies outside their own school and their own small circle of everyday experience. It does no discredit to a non-specialist teacher if some of his pupils prove to know more about crocodiles' habits or the early history of balloons than he does, though some teachers find this sort of situation an embarrassment. One can hardly expect the teacher to put in the same amount of listening-time or viewing-time as many children do, though it would be equally unreasonable not to search the programmes for what bears on lessons shortly to be given. Even the specialist teacher finds himself no longer untouched by criticism; bright learners of French, exposed to French speakers on gramophone or radio (or bringing back their own tape recordings from France), develop a critical attitude towards the class-teacher's pronunciation. But the wise teacher willingly discards the mantle of infallibility and adopts the role of leader, companion, and guide. In the new situation which the use of new media inside and outside the classroom has slowly helped to bring about, the pupils are learning that knowledge does not come from a single source but from many, and also that it can be sought for and found outside school hours and after leaving school. The teacher can do much to help; his attitude can set an example of the approach to knowledge.

Both visual and aural aids have widened the pupils' and the teachers' horizons, bringing new or better knowledge, and in certain fields, such

as that of language-learning and music, offering other models to imitate. Among the auditory aids the tape recorder has done something else; it has brought to an end the necessary transience of oral exchanges between pupils and teacher. Spoken efforts and exercises can now be preserved, and work which depends on speech has thus an enhanced importance. This affects the pupil-teacher relationship chiefly by making it closer and more alive in activities where it was not very close or alive before, but also by making both sides more conscious of what takes place orally. Where classroom recordings are frequently made also, the pupils will more often be cast in the role of 'speaker' or temporary 'teacher', and the teacher therefore more often in the role of temporary listener or 'pupil'.

The Future of the Pupil-Teacher Relationship

Where are these changes leading, and how do they affect the use of more traditional media?

We cannot assume that present-day development will continue indefinitely along the same lines. If that assumption could be made, prophecy would be a comparatively simple matter. There are limits to the amount of apparatus an education office can buy and to pupils' capacities to absorb what is given out through apparatus. For there is one thing which the 'background' teachers working through most of the aids cannot do; they cannot match their instruction to any particular class; they cannot deal with its especial problems and difficulties at a given time, or answer its questions. The competent classroom teacher, who among other things is an adaptor, can never be replaced. But how far will current tendencies go? Will the classroom teacher be obliged more and more to trim and tailor his teaching to suit the content of lessons given through the new media? Will education thus become increasingly a centralized affair? This may well happen, but hardly without sustained collective criticism from the teaching profession. The need for oral exchanges with the pupils and for individual work makes it impossible, or at least highly undesirable, to use the new media for more than a limited amount of school time daily. While it may become still more the accepted thing to draw upon what these media provide by way of teaching most subjects, and for the classroom teacher to defer, as he must, however inconspicuously, to the visible and audible specialists he switches on, the modern aids should still, if they are wisely employed, remain ancillary to the main teaching work. The learners' use of such aids will, we must hope, retain a similarity to their occasional attendance at a lecture by a well-known scientist, or at a recital by a celebrity whose excellence is beyond dispute. The main differences lie in the frequency of encounter

and in the degree of integration with the curriculum. The school is not likely to become superfluous in the foreseeable future; our children's grandchildren will not learn all they need direct from film and television, book, talking-book, and tape. But we may get somewhere near this position with the adult learner, and a great deal more can be done with the new aids if more money is spent on developing them and if much more experiment is carried on into their educational use.

The foci of attention, so far from multiplying still farther, will surely become fewer as the new media are successfully amalgamated. It seems likely, for instance, that in due course the synchronoreader¹ (or something like it), with its association of visual and auditory images, will displace the present-day tape recorder, though the latter might be preferred whenever it is desirable (as sometimes in language-teaching and in musical training) to attend to the auditory images alone. Similarly, sound-radio is yielding ground to television, itself a convenient channel for educational film. A tendency to develop only two main pieces of apparatus for classroom use may soon become visible; one with which teacher and class can make their own auditory or visual material and one which effectively presents material coming from outside. The former apparatus could be used to record the latter material for storage.

The use of self-recordings of one kind or another is almost bound, so big is the educational advantage offered, to become extensive. Observation and analysis of what has been said or done can be carried out much more effectively when repetitions of any part of the utterance or sequence of actions can be readily obtained. Constructive criticism and improvement may follow. It is not only a matter of the pupils' speech—of 'sounds' in the narrow sense—but of manner and interpretation (as in reciting a poem or speaking a part in a play) or of style and arrangement (as in giving a connected account or delivering a talk). If a recording has been made, correction need not be concurrent with the performance, and pupils may listen or look for various points during the subsequent playback. Recording and playback add to the variety and enjoyment of lessons, and may also bring in fresh voices and material which has been recorded outside the classroom. Heightened interest means greater harmony between teacher and pupil. Some of the teaching material itself also may be put on tape (and even, in a few schools, on film), leaving the teacher more liberty during classroom time to add comment, ask questions or superintend exercises; there is a concentration and saving of energy. And once again, in attending to recorded material the teacher is placing himself in some-

¹ See Section II, Chapter 5.

what the same position as the pupil; the 'face-to-face' relationship tends to be neutralized and the difference and distance between pupil and teacher to be reduced.

Since classroom time is limited, it follows that if the newer media are used at all the older media will be used less: but they are still used. The blackboard indeed is indispensable, because no other visual medium is so instantly and cheaply at the teacher's disposal. It is doubtful whether the use of the blackboard has been much affected by television and film; but the demand for better and larger surfaces no doubt results from an appreciation of the importance of visual aids generally, an appreciation which the development of film and television, as well as the improved illustration of books, has stimulated. The improvement in pictures themselves—in illustrative photographs and diagrams, for example—probably owes something directly or indirectly to film. Books have to be more attractive in order to compete with other books; also the glossy-backed textbook (and why not?) is now well on the way. And the very style in which textbooks are written may in course of time be affected by the synchroreader, with its simultaneous presentation of the spoken and the written form of a text; it is hard to believe that a printed text which rings false when it is heard, and such texts will *always* be heard, will be able to persist.

Conclusions

In summary, the traditional media will survive and the new media, although increasingly used, cannot be used to an unlimited extent. The able teacher will not be subjugated by them and will never degenerate into a mere custodian of machines. Yet his role has been subtly changed, and it seems probable that it will continue for some time to change in the same direction. School-children for long regarded the teacher (with his books) as the main source of knowledge and the chief model for imitation, although older and more advanced pupils tended to find and draw upon *other* books for themselves and thus, as they grew older, to see the classroom teacher dwindle somewhat (without appearing in the least contemptible) in their eyes. The increasing use of those new media for which material is prepared centrally (for example, by a broadcasting or film company) has a similar effect, but from a much earlier age. For reasons of economy, a relatively small number of people are concerned with the content of radio lessons, teaching films, and so on. Naturally it is specialists in the subjects concerned who are sought out to devise this content—specialists, that is to say, by comparison with most classroom teachers, and especially with general-subject teachers, to whom this fact is plain and who thus tread warily on the ground covered. It is plain enough to the pupils, too,

whose latent criticism of the teacher is thereby sharpened. Moreover, there is the magic of modernity itself, much of which has not yet worn off from the more recently introduced media, and the important consideration that children's thoughts and feelings are exposed to them outside the school as well. A situation in which, at a given moment, a pupil may be able to correct a teacher on some point of fact is now becoming fairly common, as a result of the diffusion of knowledge and opinion more widely and through a larger number of channels, several of which are shared by children with adults. A new attitude on the part of the teacher is called for. He is less alone in his teaching than he once was; he is forced to co-operate more and more with those we have called 'background' teachers. He is also *seen* to be less alone, and more as one, even if the leading one, among several. From the pupil's standpoint the foci of attention are more numerous, but most have clearly not much to do with the teacher, who is constantly obliged to adopt this standpoint. It is now more difficult for a teacher to pose as a fount of wisdom and easier to demonstrate a humbler approach to knowledge. One surely cannot doubt which is preferable.

W. R. LEE.

*The Effect of Television on Textbooks**

GROWING concern about the efficacy of traditional teaching methods and techniques has caused educators in the United States to examine critically the new media of instruction and to consider the full implications of their use in conditions which, as one authority put it, are "alarming beyond anything that teachers and the public have faced up to". With the teacher shortage running into the hundred thousands and an ever-increasing enrolment of pupils, it is natural that the experts should seek a radical solution of their problems. In such a situation, however, there is grave danger that only the immediate effects will be considered and an opportunity to carry out creative long-term planning will be missed—perhaps for ever.

With the object of throwing light on some of these problems, the American Textbook Publishers Institute held its Management Conference in 1959, taking as its theme—New Developments in Educational Materials and Media of Instruction. A note of urgency was struck from the very beginning, when one speaker made reference to the "international education race between the U.S. and the U.S.S.R." in a world which now sustained "one-sixth of all the people who had ever lived on earth". This remark reflects the underlying anxiety among educationists lest America should be unable to equip her citizens to meet the challenge of the new discoveries in practically every scientific field.

Some dissatisfaction with the standard of instruction was expressed. "That most of us survive education at all is a tribute to human vitality," said Mr. Charles A. Siepmann. "In previous generations we could tolerate this; we had time. Now time is running out."

Television and the Present Crisis

It was logical that the conference should devote much time to considering the role of television in the "present crisis in education".

¹ With the permission of *Publishers' Weekly*, New York City, this article is based on the report of the American Textbook Publishers Institute's conference on "New Developments in Educational Materials and Media of Instruction" (held March 11-13th, 1959 (in Rye, New York), which appeared in *Publishers' Weekly*, April 6th, 1959 (Vol. 175, No. 14). Copyright 1959, R. R. Bowker Co.

The point was made that educational television had offered a fresh disclosure of a centuries-old fact: that great teachers are few and far between. Through television a great teacher, confined in the past to the range of his voice or the walls of his classroom, can now reach the remotest hamlet. For example, eight students in a Nebraska high school had studied physics with the Harvey White 'Continental Classroom' films on television and were making the grade without supervision. It might be of interest to note in parentheses that the network which puts 'Continental Classroom' on the air can reach 95 per cent of the U.S. geographical area and 98 per cent of the U.S. population. As its producer remarked: "'Continental Classroom' has done more than any other single project to establish the respectability of educational television." Another speaker called television: "The most effective medium yet devised for learning." However, in any evaluation of the contribution made by television some results will always remain unknown quantities. For example, how many high school students will go on with physics because they have seen a series of programmes on the subject? How many younger children will be excited by physics from having heard about it on television? How many technicians and engineers will have broadened their fields as a result of such a programme? There is an obvious need here to explore the relative effectiveness of television teaching and the use of a classroom teacher. The so-called 'prefabricated' lesson does not involve any significant difference from what goes on in the non-TV classroom. Herein lies the main difference between American and British practice. In the United States educationists stress the widened scope that television gives to the really gifted teacher. They tend, therefore, to favour the form of 'television lesson' mentioned above. The reasons for this are to be found in the sheer magnitude of the problem; the vast geographical area and the remoteness of many rural communities, coupled with a really serious shortage of teachers. They see in television a means of giving an equal chance to the most isolated child. It is also regarded as a means of improving standards of instruction generally. Britain, on the other hand, is more compact and standards can more easily be controlled through the inspectorate and the examination system. The use of television in the U.K. is not so widespread. Influenced perhaps by experience of school radio, the trend is rather towards providing background or enrichment material.

Research directed by Mr. C. Ray Carpenter of Pennsylvania State University, to assess television "as a means of extending the university's capacities in the light of a predicted enrolment boom", had produced the important conclusion that there was no magic in television *per se*. Television did not change the organic brain processes. The

problems with television were mainly operational and mechanical. The learning process remained unchanged. The introduction of television did, however, make the teaching process more conspicuous. Conditions being equal, the medium used was of subordinate influence to *content*, to the activated abilities of students. When conditions were not equal and television was used to equalize them, television's contribution became more apparent. For students who were geographically remote, television could be the great equalizer in education. This point was elaborated by Mr. Charles F. Schuller of Michigan State University and President of the National Education Association's department of audio-visual instruction: "There is little need for research in education to prove that *this* medium is better than *that* medium," he said. "There is general recognition that you need a varied lot of things. Which things you need depends on what type of subject you are teaching and what kind of interaction you need to convey the lesson. There is no material that inherently is *best* because it is in a certain medium. There is no magic in any kind of teaching medium. Which media are to be used is determined by the answers to the questions: What is to be done with these media? For whom? Why? The over-all answer," he concluded, "clearly lies in appropriate combinations of material." Of television in particular, Mr. Schuller maintained that its major role in education was that of a catalyst, both for 'established' and for 'newer' media.

An awareness of the wider issues involved in the use of television was everywhere apparent—a feeling that here was an opportunity which, if grasped, would shape the future of American education. Mr. Floyd Rinker, executive director of the Council for Television Courses in the Humanities for Secondary Schools, talked about his group's project to produce a filmed television course in the humanities. The films included such programmes as an introduction to *Our Town*, a course on *Hamlet*, and one on *Oedipus the King*. "A film course in this field," Mr. Rinker said, "would examine the entire field of humanities—poetry, prose, dance, sculpture, and so on. Our main aim is to give the student an awareness of his national heritage, to urge him to go back through books to our cultural monuments. In doing this, television can provide a stimulus and the teacher can take it from there. I am interested in creating a course that will have meaning for every 17-year-old. We are not dictating course content. We are saying that students must hear, not merely listen; must understand as well as memorize. We want to open doors with our programme, not close them reverently. The filmed introduction to a play can be pleasanter than a printed page, but we are asking students to form a printed page in their own minds. We will encourage the publication of books for

the programmes. We do not plan to finish and bury *Hamlet* in our film about it. We want to help students to ask—and to try to answer—some of the following questions: Who am I? How did I get here? What am I to do with my life? What, if anything, is the meaning of all this?" This theme was underlined by another speaker, who said: "Television has forced a reconsideration of what education is and how it can be carried out. It has forced us to recognize the roots of education. The poets and the artists of old are the wise men of to-day; Donne's statement that 'No man is an island' is no longer inspired poetry; it is a fact of life. Our minds must be habituated to the study of excellence, to an intercourse with grandeur. Education must hitch its wagon to a star."

Federal Government Contribution

The breadth of the work at present being undertaken in the United States was revealed by a report given by Mr. Kenneth D. Norberg, who is in charge of new educational media for the National Advisory Committee on the National Defense Education Act (1958). Mr. Norberg spoke particularly about the current status of programmes under Title VII of the National Defense Act, the section which proposes research into new educational media and dissemination of the results, and which authorizes an expenditure of \$18,000,000 over three and a half years for this purpose. In the first quarter of 1959, 35 programmes had been approved under the Act. An immediate start was possible on 15 of them; the rest had to await a supplemental appropriation from Congress.

The 35 were selected from among 205 submitted proposals which the committee had considered up to that date. Of the 205, 141 were submitted by colleges and universities, 4 by state departments of education, 35 by elementary schools, 6 by miscellaneous organizations in education, and 19 by profit-making organizations (which had to be rejected because the Office of Education was not empowered to make grants to profit-making organizations). Of the 205 applications, 76 dealt with television experimentation, 21 with tape recordings, 6 with radio, 32 with movies, 7 with automation, 56 with combinations of media, and 7 with miscellaneous media.

Areas covered by the projects which have been approved include the use of television, particularly closed-circuit television, for teacher training; an analysis of the use of television tapes; presentations of experienced teachers on television; short filmstrips for use in behavioural and developmental courses; testing filmed demonstrations against classroom demonstrations in a mathematics course under revision at the high school level; teaching Russian to elementary school

pupils by means of television; using television to prepare pre-school children for the experience of going to school; state-wide television broadcasting of courses not otherwise available in small secondary schools on a Saturday seminar basis; experiment with teaching machines; creating a package of materials to teach a foreign language.

"With Title VII," Mr. Norberg said, "we now have Congressional recognition of the importance of re-examining schools and teaching. Title VII owes its existence to *Sputnik* and to the new mass media of education, particularly to the great amount of publicity which educational television has received. There is heightened awareness of teaching as a problem subject to scientific analysis. Teachers heavily involved in the new media are becoming better teachers," Mr. Norberg concluded. "The medium of television makes its own stringent demands. A teacher who has once been a TV teacher will never again be quite the same."

The Future of the Textbook

The conference moved from television to assess other media and, as was to be expected of a Textbook Publishers' Institute, to a consideration of the role of textbooks and books in general. In an invigorating and provocative address, Mr. Philip H. Coombs, Secretary of the Fund for the Advancement of Education, suggested that the present-day textbook was 'obsolete'. "Any textbook is out of date from the day it is published. It is as stale as yesterday's newspaper. Our overriding aim in the educational revolution must be to equip our young people for continuous learning. To achieve this the forms of educational publishing will have to change." The traditional textbook, Mr. Coombs thought, might evolve into a series of monographs to be altered at will, thus providing greater flexibility of course content. Mr. Coombs foretold the most exciting era yet for printed materials of instruction. "It won't be dull. It may even be financially rewarding. The dullest publisher will have to be carried kicking and screaming into the new educational era." Several speakers took issue with Mr. Coombs on these points, which was, no doubt, what he intended. The consensus of opinion was that there was no reason why textbooks should not continue to be used—"marble-backed, hard-backed or paper-backed." The binding was just a matter of convenience. The textbook would remain important in some form, but the familiar heavy, bound text would give way to shorter units. Publishers, through the production of many kinds of material, could keep education from becoming wholly syndicated. (A fear expressed by many present.) At the college level the traditional 800-page, \$7.50 textbook was giving way to the 50-cent paper-back. This point reflected a

remark made by an earlier speaker: "We need more soft-back material which can be developed at short notice." And yet another speaker: "I would make a plea for cheap books."

Television could not replace the book; on the contrary it would enhance its value. Television *sells* books, since its teaching technique places greater emphasis on independent learning—through textbooks and other 'research' materials. For example, Washington County school librarians had made displays of books involved in a given week's programming. This had resulted in increased use of the school libraries. By breaking down dependence on a classroom, television placed more emphasis on the reading of books and less on school attendance.

The 'Package' Deal

It was suggested, however, that not enough publishers were "sensitive to inter-relationships among media of instruction". More publishers should produce films, filmstrips, transparencies, etc., for use on classroom projectors in conjunction with their textbooks, and thus relieve teachers of their task of acting as 'sound tracks' to their textbooks. There was already a noticeable trend in American education towards using 'packages'—that is, specially prepared combinations of printed matter, films and filmstrips, tapes and other props geared to a given course on television or elsewhere. Mention was made of a television station producing a series on Japanese brush painting which offered the necessary do-it-yourself materials for use with the programmes.

This approach to teaching called for greater emphasis on teamwork in the development of instructional materials involving more people from the production, publishing, and educational spheres. "We must plan," said one speaker, "so that television, filmstrips, transparencies, and printed matter can all do the job they are supposed to do."

In this context it is worth noting a similar practice in the U.K. The British Broadcasting Corporation has for many years published booklets to be used in conjunction with their programmes. They have long been admired for the quality of content and production and for their low price. The British Council, too, has been aware of the need to take advantage of all the media of instruction. It supplies to its representatives abroad, for loan to various organizations, *boxes* containing a short lecture on a chosen subject, such as the English education system, together with filmstrips, wall charts, printed pamphlets for distribution, and other exhibits as appropriate. Gramophone records and ciné films are also included if available. The Council has gradually built up a library of these *boxes*.

A sincere desire to enliven as well as to enlighten seems to be the

basis of present-day American discussion; to make the young think as well as to instruct them. There is an all-pervading determination among educators to achieve something greater than a 'waist-high culture'. Perhaps Mr. Jerrold R. Zacharias, director of the Physical Science Study Committee, should have the last word. "With our physics course, we were scared it might become too successful, that the kids would not be able to break away from the films. That's why we produced the books to go with the course."

With every innovation in the past it has been assumed that it would sweep away everything else in that particular field. In education, however, innovations have provided enrichment by allowing greater diversity of approach. They have offered just another string to the educator's bow. From the evidence provided by the conference we may sum up, then, as follows: (1) that each of the media of education has unique characteristics and a unique contribution to make to the learning process; (2) that the textbook may undergo considerable change for more integrated use in concert with newer media of instruction; (3) the textbook is far from dead as a vehicle of instruction, and indeed may have greater influence as educators come to place more emphasis on independent learning.

The present writer has been stimulated by the foregoing to envisage a course in a modern foreign language presented on television by an able teacher exploiting both the aural and visual factors of that medium to the full, supplemented by a 'course' book specially written for the programme, and by sound recordings of difficult or intricate speech patterns which the student could listen to and practise between broadcasts. A tape recorder would enable the student to perfect his pronunciation and intonation. Specially prepared filmstrips would provide illustrations of new vocabulary and be the subject of oral work. Ciné films would offer background information on the country being studied. Finally, and perhaps this is not the least important, a good teacher is needed in the school to integrate the various media and to encourage the more backward students.

CLAUDE V. RUSSELL.

The Origin and Theory of Isotype

IN most people visual impressions are the strongest. Otto Neurath's memories of his own childhood in Vienna led him to believe that this was particularly true in the case of children, but he also became aware that the influence of our educational traditions lead one away from the visual to the purely verbal. The use of pictorial symbols instead of purely abstract units has the great advantage that one can see what the chart is about even before having read the caption.

Otto Neurath's Contribution to Visual Education

Otto Neurath began his work in visual education during the First World War when he was asked to organize and direct a museum of war economy in Germany (as he had been one of the few who had anticipated the need for war-time planning of production and consumption). Recognizing the even greater need of social enlightenment in a newly founded democracy, he wished to extend the scope of this work in peace-time. His first opportunity arose from the housing drive in Vienna in 1923. The great housing shortage stimulated keen interest in housing problems, and an exhibition on the subject with proposals for its solution met with wide support. After the exhibition he persuaded the city administration of Vienna to found a museum on housing and city planning. A year later he proposed that it should be developed into a Social and Economic Museum (*Gesellschafts- und Wirtschaftsmuseum in Wien*). In 1925 Otto Neurath built up a team and with it created the method which is now called Isotype.

The name ISOTYPE itself points to some of the ideas behind the system. Originally, Otto Neurath called his system the 'Vienna Method' in recognition of the part played by the city administration in making the work possible. The name ISOTYPE, introduced ten years after the birth of the method itself, stands for *International System Of TYpographic Picture Education*; the word can also indicate uniformity of symbolism.

In the museums he established photos, models, objects, sections, diagrams, statistical charts, maps, and historical charts were assembled to form a meaningful and stimulating whole which could be easily understood by the man in the street. Special attention was given to the method of statistical representation. At that time haphazard use was

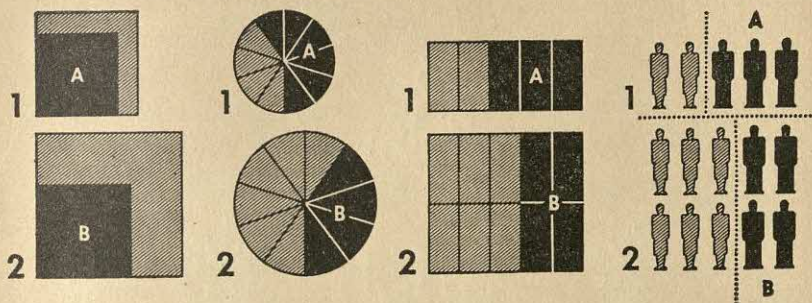


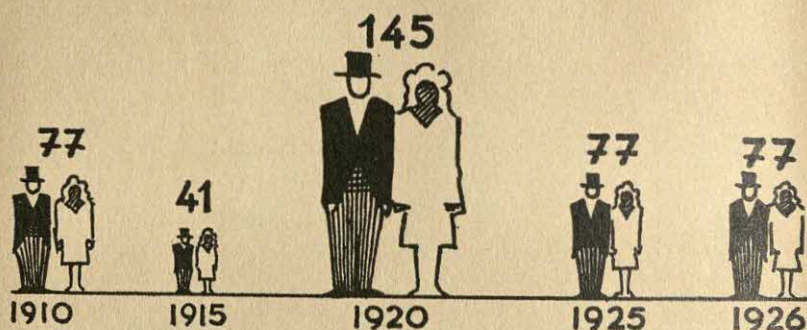
Chart 1.

made of many methods—as still happens to a certain extent even to-day. Otto Neurath examined them all critically and systematically and compared their relative merits. Chart 1 is a summary of the results. Each diagram presents the same data in a different way. That the interpretation is affected by the diagram chosen is immediately apparent if the following questions are attempted: What are the relative sizes of—A and B; 1 and 2; A and 1; B and 2; A and 2; B and 1; A and 1-A; B and 2-B; 1-A and 2-B? Only approximate answers can be given to some of the questions on the square diagram. It is possible to give exact answers to the third and the fourth questions only in the case of the 'pie' diagram. With the last two diagrams all the questions can be answered.

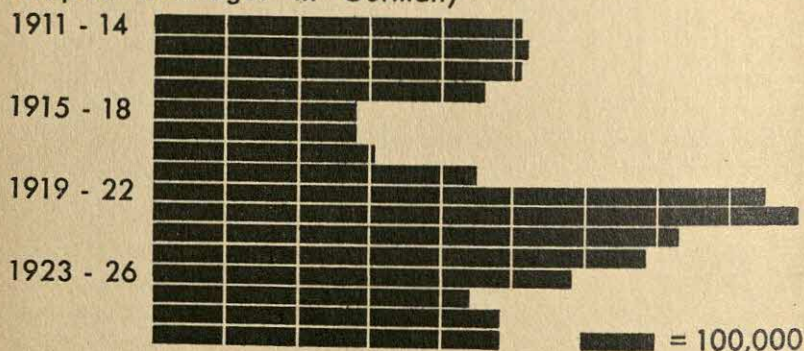
There were pictorial charts in use before the Isotype work started, and here and there one would find that a little picture was repeated as a basic unit showing quantity, as in an Isotype chart, but in most cases the size of the symbol itself was varied by being reproduced from the same design on a different scale. This makes quantitative comparison doubtful. Should the height or area or volume be compared? In Chart 2 it is obvious that heights are being compared, but the visual impression is very misleading indeed. The designer obviously realized this and added the actual figures involved. The original graph indicates the annual changes clearly enough, but does not stress the actual subject of the fluctuations which the simplified Isotype chart makes clear at first sight.

Otto Neurath gave serious thought to visual methods of instruction and discussed them in many lectures with lantern slides, and in many illustrated articles; at the same time he built up his museum in the Vienna Town Hall with several branches in other parts of the town. These became well known beyond the boundaries of Vienna. There was at that time no tradition of visual communication on which one could build, except perhaps among map-makers, and there was hardly any special vocabulary for discussing the subject. No one made it his job to think out ways of representation from the layman's point of

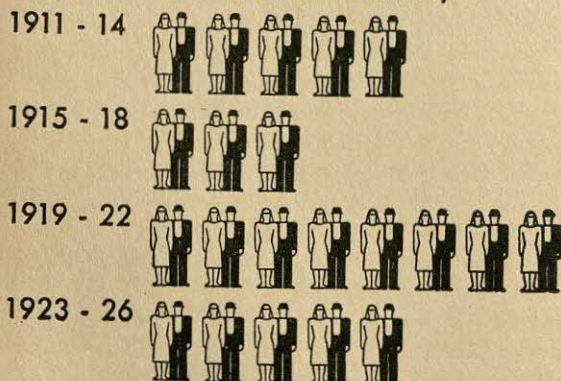
Marriages in Germany per 10,000 population



Graph: Marriages in Germany



Isotype: Marriages in Germany



Each couple represents 100,000 marriages a year

Chart 2.

view or act as interpreter for the public. Otto Neurath postulated that for every chart someone was needed to form a link between the experts who provide facts and figures and the artist who shapes the design. The work allocated to this key person is called 'transformation', as it involves the conversion of scientific statements based on research into an essentially visual message which is clear, accurate, intelligible, and worthwhile. It is also the responsibility of this key person to apply the rules formulated and used in earlier work, so that the reading of new Isotype charts does not require an extra effort to un-learn old and re-learn new rules.

After the first ten years of Isotype work some of the rules were formulated and published in *International Picture Language—the First Rules of ISOTYPE*, by Otto Neurath (Psyche Miniatures, in Basic English, Kegan Paul, 1936). Some principles were expressed in slogans like these: "The best teacher is he who is best in leaving out." "It is better to remember rough approximations than to forget exact data." "It is unnecessary to express in words what can be shown in pictures." "The essential points made by a good instruction chart are evident at first glance, the less important points at the second glance, and details at the third; if it shows more at the fourth glance it is a bad chart."

Technique of Symbolism

Much attention is given to the design of self-explanatory simple silhouette symbols which bear repetition. Details should only be added where they convey meaning. Colours are used to make distinctions and have symbolic meaning. Symbols are combined to form composite symbols, as words are combined to form composite words; e.g. brick-layer is represented by a symbol for bricks superimposed on a symbol for man. A simple ship is used as a symbol for exports or imports; thus, a coffee symbol on a ship would stand for exported coffee, the same in outline for imported coffee, and so on. (See Chart 3.)

Not all such rules are absolutely self-explanatory; the symbolism has to be learnt to a certain extent, but it should be easily learnt and remembered. It has never been the aim to make Isotype charts without any explanatory words attached. The Isotype picture language should assist the word language but is not intended to replace it. Every Isotype chart is a teaching chart, and as details have to be restricted within one chart, so the total number of charts presented to a group of people should be limited. Visual memories are strong and lasting as long as there is not too much overlapping. For that reason charts in a series should be readily distinguishable from one another, although they should be homogeneous as regards the 'language' used. It would be wrong to change methods of representation for the sake of making an

PRODUCTION AND DESTRUCTION OF COFFEE, 1933

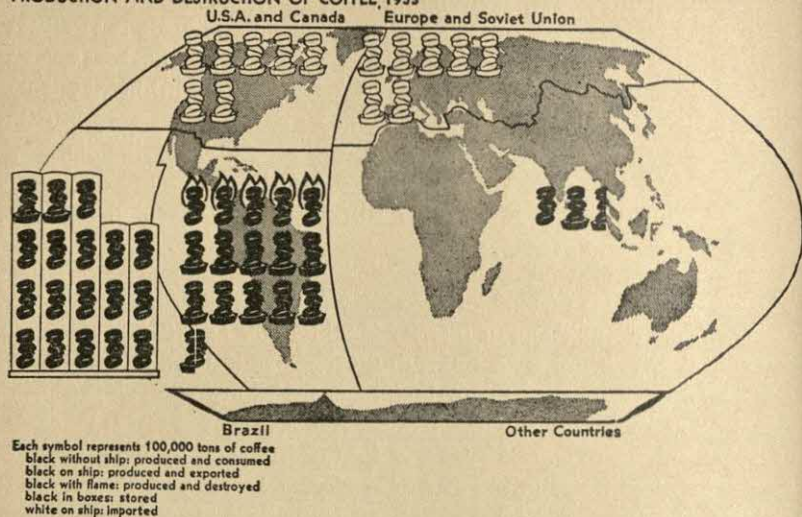


Chart 3.

exhibition or book look more varied—this would only make the assimilation process more tedious and more difficult. The visual interpretation should aim at bringing out what is most exciting in the facts selected.

The Isotype technique has been adapted to a great variety of media: wall charts in museums, exhibitions, classrooms, lantern slides or filmstrips, animated film diagrams, illustrations of articles and books, picture books with text or with questions, magnetic maps and charts, flannelgraphs, models in wood or glass, flat relief, three-dimensional symbols, layout and co-ordination of objects and other exhibits, etc. Games have been devised, special apparatus with tests or questions and answers have been designed for use in exhibitions.

These manifold opportunities have given the Isotype team a chance to observe the effect of their work and to study the relative merits of the media employed. The museum was a very useful testing ground for the development of the work. Many school classes came to the museum, and the members of the team acted as guides. In addition, a school in Vienna was selected to experiment with the method in the teaching of various subjects to boys of 10 to 14 years. Teachers formed discussion groups to conduct similar experiments in other schools. Several pages in a school periodical were regularly put at the team's disposal. Isotype material was provided for the older children, but the very young drew symbols and charts for themselves, inventing them

where possible. Most satisfactory results were obtained, and even normally unresponsive and backward children who hardly reacted towards ordinary teaching became alert and lively when looking at Isotype charts, and expressed themselves spontaneously and volubly when confronted with the simple pictures. Other experiments were later carried out in Nigerian schools with similar satisfactory results.

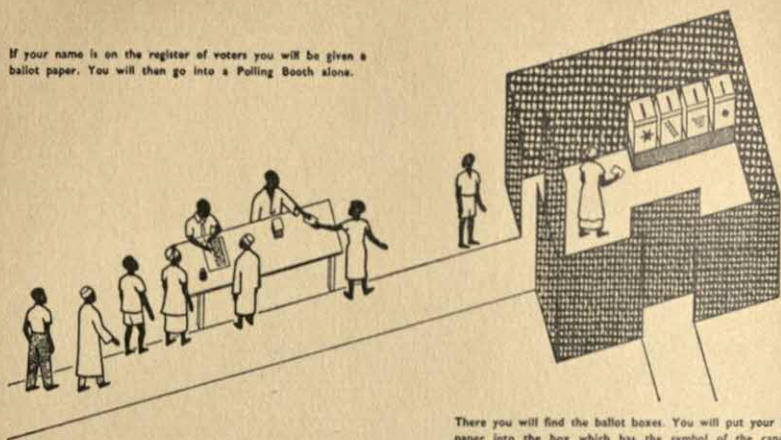
It is usual to adapt a few visual aids to the already existing curriculum. But the adoption of these aids as an equal partner with oral explanation would serve as a basis for comprehensive reform in which an entirely new curriculum could be built up throughout the school. Ideas as to what is suitable or unsuitable for a child of a given age require revision when one is confronted with visual aids. For example, it is impossible in the traditional curriculum to discuss differences in population densities until a certain standard of educational attainment has been reached. By using visual representations such facts and figures can be understood in their essence by infants who can spot immediately whether one classroom is more full than another without even being able to count the number in either. More full is distinguished from less full as dark blue is from light blue. Comprehensive educational reform would combine oral and visual education in one coherent whole.

The Universality of Isotype

The international character of the symbols has occasionally been tested, but only in the Western world and in temperate climates. In the United States charts have been used with success all over the country and for all strata of its population. In the Soviet Union the method was used for about a decade, especially in making the Five Year Plans and made their results known to the general public. In Mexico some instruction was given to the staff of a museum for science and industry founded by the Council for Higher Education. In the charts for an Arabic publication the arrangement had to be adapted to the style of writing which starts at the top right-hand corner. New symbols were needed for tropical Africa for such things as crops, tools, animals, man, woman, child, house, etc. The existing symbols had to be altered to make Isotype charts comprehensible to these Africans. Every chart has to represent a familiar visual background—adherence to the method cannot go as far as imposing an alien background on those unable to share one's experience of it.

Any modifications of shapes and arrangement does not imply that the system had to be radically changed. The Isotype system is an elaboration of the child's approach which is more or less universal, and it appeals to a certain level of commonsense. Anthropologists who tend to concentrate on the differences between peoples predicted that

If your name is on the register of voters you will be given a ballot paper. You will then go into a Polling Booth alone.



There you will find the ballot boxes. You will put your ballot paper into the box which has the symbol of the candidate you want to be elected.

Chart 4.

Isotype would be misunderstood and misleading, but there has been no evidence of this at all. In adapting the method to the needs of the semi-literate, only a certain slowing down of the rate at which new ideas are represented is required. Each chart should offer, as it were, something for the first and second glance only, but nothing for the third. A whole booklet was designed to instruct the people of the Western Region of Nigeria how to become registered as voters. The high percentage who responded showed how well the message was grasped. (Chart 4.)

Many of the general Isotype rules are applicable to any field of knowledge; any clear scientific statement can be expressed in Isotype terminology. A number of charts for the teaching of biology, technology, history, and geography, and for health education were made for the museum in Vienna, and many more charts of this kind have been and are being produced by the Isotype Institute in London. The basis of teaching with visual aids consists in the comparison of two or more pictorial representations side by side, whether of statistical data, sequence of events, or stages in a development. Where an illustration would show only one section of a flower, for example, an Isotype chart would show as many of them as were required to demonstrate the essential phases. (See Chart 5.) Taking another example, all the essential steps for complete understanding of the working of a steam-engine would be included and the colours used would help to indicate where it was hot and where it was cold.

A basis has been laid for the development of the visual consistency of the map-maker and for its application to all branches of human knowledge. Education through Isotype could make a chain of understanding

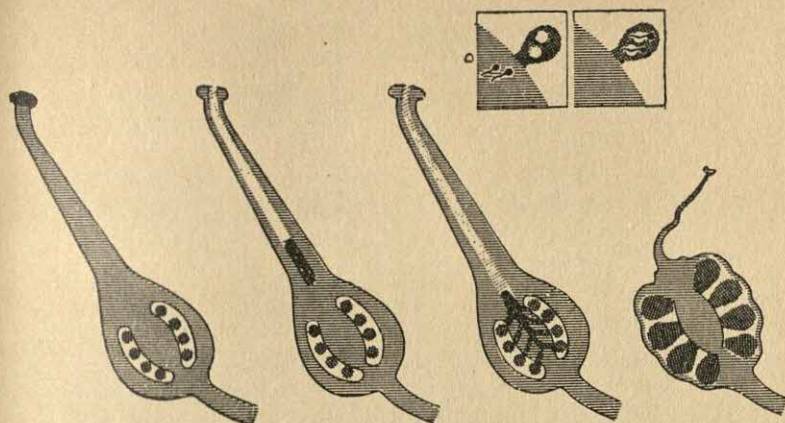


Chart 5.

between peoples, transcending the varieties of life and educational background, bridging the gaps between the illiterate and the literate from the age of four upwards.

MARIE NEURATH.

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* By Otto Neurath.

† By Marie Neurath.

‡ With Joseph A. Lauwerys.

CHAPTER EIGHT

Speech and the Written Word in Education

THE earliest means of communication between man, and that which remains the basis of all communication, whatever form it may assume, is speech.

Many languages are spoken in the world, some by hundreds of thousands of people, others by only a few thousand. In every community, within the home and outside it, speech plays a large part in the important early stages of a child's education. But languages, as such, are only learnt at school. For this to be possible, spoken language must first become governed by rules and must be preserved by means of the written word. In every school in every country of the world much time is spent in trying to get children to understand and make use of this essential route to a fuller life. For by the use of the written word we are able to communicate with other human beings separated either in space or by time. In schools the written language is studied, the spoken form being little more than a tool used to explain and ensure its correct use. In modern times a change has come about. Thanks to modern inventions it is possible to preserve and to transmit over great distances spoken words and pictures. In fact, there now exist new means of communication which differ from direct speech and from the written word.

Consideration of these essential facts at once gives rise to a large number of questions. When a child of six comes to school for the first time he knows only the spoken form of his language. When he first meets the written word, is he asked to make the same sort of effort as when he learned to speak? Or is he expected to do something quite different—something which demands intellectual powers of another kind? If a large proportion of the time available is nowadays devoted to the acquisition of a mastery over the written language, will not the use of audio-visual means of expression, occupying, as they do, an ever-increasing place in the curriculum, result in a lower standard of achievement in language, and especially where the written word is concerned?

Teachers would do well to give careful thought to this matter.

We shall now examine in turn and in broad outlines the following:

(1) the spoken language of children of six and the intellectual habits which it would seem to indicate;

(2) the written word and the intellectual effort it requires, and the qualities necessary for its thoughtful use; and

(3) the changes brought about in language and the use of it by such modern inventions as the radio, television, and cinema.

The Language Spoken by Children of Six Years of Age

To understand their language, you must consider how children learn to speak. Speech is a social acquisition; it is not the result, as, for example, in the case of walking, of the development of an instinct. But a child is surrounded by language. He learns very early how useful it is to be able to understand what is said to him and to express his wishes. He makes amazing efforts to understand the words he hears and then to make use of them himself. These efforts never demand more than his mind can give; far from it; usually his mind is by no means extended to its limits. Moreover, he makes these efforts of his own free will because he feels they are important.

How can he interpret the sounds he hears? They have no meaning in themselves; all language is a convention. Obviously the child does not try to analyse the meaning of the words in a sentence. The words he uses and those which he understands are fragments of sentences in which the situation plays the part of the subject, and in which expression and intonation make clear the connexion between this situation and its predicate—the word understood or said.

For example, a small child 14 months old comes to look for its mother: "*Maman ici*" (mummy here); it pulls her towards the armchair; "*assis*" [*assieds toi*] (sit down); "*open*" [*prends moi sur tes genoux*] (take me on to your lap); "*à têter*" [*donne-moi à têter*] (give me some food).

At this stage, the thought is more advanced than the language. However, little by little, grammatical construction becomes normal children learn correct grammatical usage, and words are put in their accepted order. Obviously this is learnt through repetition. Some sort of mechanism is set up in the child's mind which eventually acts upon his very thoughts. Correctness of expression is gradually achieved after many fumbling attempts have been made. There comes a moment when children use a number of expressions for which they do not know the exact meaning, but which form part of a sentence they have learnt as a whole. This means they have learnt how to speak. They are now capable of composing sentences by putting together words the meaning of which they have learnt either absolutely or by association, and every trivial happening can now be the topic for a sentence.

What point have they reached in their development when at the age of 6 they are first taught to read and write?

For the sake of clarity, consideration will first be given to sentences composed by children and then to certain aspects of children's vocabulary.

Sentences Composed by Children

The sentences children compose are still closely connected with their concrete context. First of all they are concerned with action, not only because, as has been shown by M. Piaget,¹ they actually accompany action, but because children make use of gesture and facial expression in order to express what they are unable to describe or suggest in words.

In the course of a conversation a child comes forward: "*Les poules aiment l'eau*" (Hens like water). "*Dame non!*" (Of course they don't), retorts another. "*Quand il pleut, ils baissent la queue et elles se tiennent comme ça*" (When it's raining they put their tails down and stand like this). With a sudden movement the child thrusts forward his stomach and chest and lowers his head. He could not have described the hen by means of words. His gestures amplify his sentences. Many examples of this can be seen and careful observation cannot fail to show that what is most important and has most meaning for the majority of children between the ages of 5 and 7, whether they are speaking (and especially when they are telling a story) or whether they are listening, is action, and for this gestures are as important as words.

Let us watch a group of school children arguing in a corner of the playground. Their whole bodies are expressive and full of life. Their eyes sparkle with amusement or are full of threats; their hands and arms wave about. "*Moi, mon vieux . . .*" (I say, you chaps . . .) and the small boy who is talking comes forward into the centre of the group of listeners, raising his right arm as though challenging unseen enemies; there he stands firmly, legs well apart; a minute later all is changed; his shoulders are bent; he looks as though he were on the point of running away. Words are superfluous; we know that he was frightened and are not surprised to discover that he is telling a story of circus tigers which nearly escaped. When the story is finished he assumes an attitude of pride and self-assurance: surely one has every right to feel proud of having experienced such emotions. All his friends have been listening to him; even more, they have been watching him; not a single gesture or facial expression has passed unnoticed by them. All those who then try to take the centre of the stage make every effort to attract and hold the attention of their audience by

¹ J. Piaget: *Le Langage et la Pensée d l'Enfant* (Language and Thought of Children). Edited: Delachaux & Niestlé. See pp. 25-6.

means of their mimicry. The latter is obviously essential to the speaker if he is to express clearly his own thoughts, and to his audience if they are to understand what is said.

The tone of voice is closely connected with the mimicry. In fact the tone, and the musical pattern of sentences, are the first things in language to be noticed by children. It is the tone of voice, whether it be sad, imperious, gay, affectionate, or hostile, which has taught the child the meaning of exclamations, words, and sentences. When children first try to talk they utter confused sounds which are meaningless, but which imitate the musical pattern of the language familiar to them. By the time they are 6 they have acquired the rhythm of proper sentences. This is more marked in children's speech than in that of adults; their accentuation is more noticeable and more expressive.

A child is going to jump into the sandpit in the playground. He wants the others to admire him. "*Regardez le saut!*" (Watch me jump), he shouts. He accentuates the last word, says it more loudly and in a higher tone than the other words. "*Sortez-vous tous!*" (Get out, everyone!) Great emphasis is laid upon the word 'everyone'; 'get out' is passed over lightly. In the following sentence, "*Retirez-vous, les gars!*" (Go away, boys!), there is an accent on both 'away' and 'boys'; in addition he gives an authoritative wave of the hand. No one obeys him; he becomes angry and shouts, "Go away!" Now the 'away' is given great force, so much so that it almost becomes a shrill cry which diminishes in volume but does not end until he runs out of breath.

The expressive form of children's sentences is the result of both their need for self-expression and the fact that they make freer use of language since they are as yet incapable of great complexity of thought and therefore do not require complex or compound sentences. Instead, as each thought comes to them, they express it with no regard for the accepted conventions of language which will later rule them.

When a child thinks of something to say about the interests of the moment, his thought is expressed as a whole; he may add successive ideas in the form of co-ordinate clauses, but rarely does he subordinate one idea to another. Children make frequent use of co-ordinating conjunctions, especially 'and'; subordinating words such as relative pronouns are far more rarely employed. M. Piaget has devoted a long chapter to this question and has shown that a child of 5 to 7 years uses conjunctions to show merely that one thing follows another, with only a slight feeling for their connexion. For example:² "*J'avais une*

² J. Piaget: *Judgement and Reasoning Power in Children*, Editors: Delachaux & Niestlé, 1900.

fois, lit à haute voix une page, pourrait-il donner à tous les mots leur intonation juste s'il n'avait dès le début des phrases en cours au moins un sentiment de leur forme générale? Ce sentiment ne fait qu'un avec la conscience du mot prononcé, dont il détermine la valeur et auquel il fait donner l'accent qui lui convient. Cette valeur spéciale des mots dépend presque entièrement de la construction grammaticale; 'pas plus' appelle immédiatement 'que'; après un 'encore que', nous attendons un 'cependant', un 'néanmoins' ou un 'toutefois'. Ce pressentiment du mot ou de la tournure qui vient peut-être assez parfait pour permettre à un lecteur, d'ailleurs incapable de comprendre quatre mots du livre qu'il lit, de donner l'impression d'en pénétrer les nuances les plus délicates."⁷

This explanation, as stated by William James, is excellent: the mechanism of a language becomes confused with its grammatical structure. The minute a 6-year-old child learns to read, he has some idea of the salient points of this grammatical structure, but he is helped and helps himself both to understand and to express himself by the context, action, and intonation.

There are, however, certain difficulties which he will have to overcome before he masters this same grammatical structure in the written language. Will he now have any external aids to help him?

The first thing he must do is to learn to translate, without conscious effort, the written signs before his eyes into sounds. A fluent reader sees words as an indivisible unit; he knows what they are as soon as he sees their general shape and the first syllables; sometimes even a few down strokes are enough for recognition.

For fluent reading rapid recognition of words is essential; it is not necessary to know the exact meaning of every word, nor do you need to remember having met words before: all that is necessary is that they should seem in some way connected with words you already know. A foreign word constructed differently from the words to which you are accustomed makes you hesitate in your reading, but

⁷ How could a man, reading a passage aloud at sight, give each word its correct intonation, unless he had from the very beginning some inkling of its general tenor? For this feeling, combined with a perceptive understanding of each separate word, enables the reader to decide on the relative importance of the words in the sentence and therefore to give each its correct intonation. The comparative importance of words is almost entirely dependent upon grammatical construction; 'not more' makes one anticipate 'than'; after 'although' we expect 'however', 'nevertheless', or 'yet'. This intuitive knowledge of the word or phrase which comes next can be so correct that the reader, although he is in fact incapable of understanding two words of the book he is reading, can give the impression of understanding even the most delicate shades of meaning.

if you come across a word of which you do not know the meaning, as long as it is in the familiar language and the sentence is constructed in the usual way, you are not held up at all.

In addition, for fluent reading your eyes must be able to take in the meaning of words more quickly than your mouth utters them. This aspect of reading has been studied in great detail in American laboratories and does not come within the scope of this article. Nevertheless, it is an accepted fact that such swift visual comprehension is essential for good reading. By it the reader is able to form some idea of the length and shape of each part of the sentence even before he has read the whole of it. He feels what pauses are necessary before coming to the actual punctuation marks. In fact he is helped to foresee the grammatical function of the words he reads and he is able to avoid making gross errors because his rapid visual reading tells him that certain words which he expects are yet to come.

Mention has been made of the help punctuation can give. Undoubtedly it can be very helpful indeed. Many pages, as delightful as they are superficial, have been written on the art and magical power of punctuation. In practice we often make pauses not shown by any punctuation marks. Then, on the contrary, we sometimes go straight on without paying any attention to them. Not every comma, not every semi-colon, not every full stop has the same force. Punctuation marks are signposts placed at danger spots, but they are not always to be found there; above all, they are signposts on which there are no exact directions; they must always be interpreted according to their grammatical context. Herein lies the key to the problem; the art of reading fluently is partly intuitive and partly guesswork. If you are going to read well you must give to certain words such emphasis that they seem to make you expect what follows them. In general, punctuation shows the grammatical structure of the sentence and makes intuitive logical analysis of it easier.

If, when you are reading, you try to analyse carefully the processes involved, you will notice that attention is paid only to the key words: nouns, verbs, and adjectives. All other words are guessed at rather than read and understood; they are so short, so well known, met so frequently, that this is easily done. From among all the words in a sentence the reader seizes upon those which are most important in the expression of ideas; his mind recognizes them by their shape and, as far as nouns are concerned, by the words which go with them such as articles and adjectives. The rapidity with which you read determines how long your attention remains on any particular phrase. Then moving on from an expression which may be formulating an idea (the idea itself may not be fully understood), your attention passes on to

the next. It skims over connecting words. In this way you recognize groups of words in a sentence instinctively since you only pay attention to key words, especially nouns and verbs.

It seems that the preceding remarks apply to all languages. The observations which follow, incomplete as they are, are only strictly true in the case of languages, such as French and English, which no longer employ the system of inflexions such as that used in Latin to show the grammatical connexion between words.

Let us examine the following sentence written by Anatole France: "*Assis dans son fauteil, devant son bureau, mon père examinait, depuis quelques instants, un petit os pointu d'un bout et tout fruste de l'autre*" (Sitting in his armchair, in front of his desk, my Father had been examining, for several minutes, a little bone pointed at one end and worn smooth at the other).

As soon as I see the word 'sitting', I know, because of its form, that it is being used as an adjective and I then expect to be told what noun it is describing: it is followed by three words which are in no way separated from it and so, instinctively, I put them into the same group. The next group of words begins with a preposition, this tells me that the noun 'desk' is not the subject, so I now expect the subject of the sentence. Next comes the word 'father'. I know that this is an important word, the one described by 'sitting'; in other words, the subject of the sentence, since it is the first noun not preceded by a preposition. I read the verb 'had been examining' which denotes the action performed by the subject. Because I have been familiar with this verb for a long time I know that the action it calls to mind requires a direct object. So now I expect a direct object. But immediately after the verb I see a group of words enclosed by two commas and introduced by a preposition. This tells me to change my tone of voice because I have been given warning of a break in the natural continuity of the sentence—instead of the direct object I have an adverbial phrase of time. Next comes the direct object 'a little bone'; so I link this up directly with the verb. Now I see the word 'pointed'; I know by its form that it is an adjective; since it comes immediately after the noun 'bone' it can only be describing this word. It is itself completed by an expression followed by the conjunction 'and'. This conjunction warns me that the thought is continued. It might well be connecting two phrases, but this is not in fact the case. A few words farther on I see a full stop. I cannot see any comma and the word which catches my attention is an adjective. These words complete those which I have just read. Having read the expression 'at one end' without thinking about it, I expect the parallel expression 'at the other'.

Thus when we read anything, each word is surrounded by a complex network of ideas.

The Contextual Framework of Words

This network is formed by the very nature and usual context in which the words are found. I had to be able to recognize the word 'sitting' as an adjective in order to read the sentence properly. I had to know that the word 'father' is a noun and the words 'had been examining' formed a verb. We use such grammatical terms for convenience and we must not fall into the error of thinking that it is essential that all these words should be given their grammatical label. All that is needed is that their function as nouns or verbs and how they are connected should be understood.

Since we are familiar with the grammatical function of words and the part they usually play in a sentence we tend to connect them up with each other without thinking what we are doing. Each one of them by reason of its grammatical nature and its usual role is the very word expected because of what comes before, and in its turn it makes you expect something else unless the construction of the sentence, perhaps by means of a punctuation mark, tells us that a slight pause is coming or even the end of the sentence.

Many signs tell you what sort of thing to expect. We have spoken of punctuation, a guide which, although indispensable, is not complete in itself. The form of words also acts as a guide; it has been pointed out earlier, when the grouping of words was being discussed, that their essential nature could immediately be understood because of their very form: they can either have other words depending on them or they can merely show the connexion between other words. Nouns occupy a special place because so many words can depend on them and these words are useful for the anticipation essential to all reading.

In both English and French the position of words tells you very clearly what part they play in the sentence. It is because the subject (usually) comes before the verb and because the verb is followed by the direct object that I had no hesitation in deciding that 'my Father' was the subject and that the words 'a little bone' contained the object. Doubtless the secondary elements of the clause may be put more or less where you wish in accordance with the demands of the ear or the thought. There are occasionally relationships which the French grammarian Ferdinand Brunot calls 'implicit'. The words neither agree, nor are they put near to each other, nor even placed in a characteristic position. Nevertheless the mind understands unmistakably the connexions which exist between them. This can be done because

guidance is given by analogy with similar phrases or some sign points out the relationship.

Tool Words

Now we come to 'tool' words, whose function is to indicate the relationship between words. We have already pointed out that when you are reading rapidly your attention is not held by these words; and yet they are extremely important. It was because the word 'desk' in the earlier passage was preceded by the preposition 'in front of' that I knew immediately that it was an adverbial phrase of place. It was because the expression 'worn smooth at the other' was joined to the preceding clause by the conjunction 'and' that I knew what part it played in the sentence. In addition, these particles have a meaning of their own: 'but', for example, creates quite a different atmosphere and tone from that set by 'and'.

It would be possible to point out other facts. It could be noted that a large number of clauses depend on words which, as a result of long association, have become united to other words by indissoluble links. In the sentence we have examined, for example, the words 'at one end' made you expect 'at the other'. Sentences constructed round 'not only' . . . 'but also' provide a very good example of the sort of thing meant.

In the same way—but this is a more subtle process—verbs, which are usually transitive, make us expect an object.

This is an independent process. It forms something complete in itself, independent of the conscious thought of the reader; his attention can wander, can return now and again to the text, take in some part of it, follow it closely for a moment, and then wander away again.

The essential thing is not so much to introduce children to this process and to make them master it, however difficult it may be, but to make them accustomed to using it either to understand what they read or to express their own thoughts.

A passage is understood when from the very first words one forms vaguely, and unconsciously, some idea of its meaning. An idea is obviously suggested by the passage, by its words and their grammatical arrangement; but it is also in fact drawn from our own fund of knowledge and experience. The words which follow make the idea clearer, fuller, or perhaps, on the other hand, invalidate it. So the understanding of a passage depends upon a general idea, which is immediately suggested to the reader and which he tries to think out, being elucidated by the precise expression in words of the thought of the writer. In fact, we only really understand what we ourselves have first anticipated and tried to express, what we feel we ourselves in our turn could

produce and even carry further, making use of our previous experience, helped and clarified by a new, or at least a different, point of view. To do this, one must have mastery over the written language, for the greater one's skill in the use of it and the less one is aware of its intervention, the more easily understanding is achieved.

Thought and the Structure of Language

So this is the aim: a passage one is trying to understand is, in fact, only a subject for thought. This does not, of course, apply to poetry, the response to which depends upon emotional and aesthetic awareness.

When the structure of the language has been fully assimilated it becomes possible to express thought with precision, with such subtle shades of meaning as it may require. Then language becomes the servant of thought, which can enrich it by the addition of new forms and expressions.

We started with an obvious fact and have tried to deduce from it very important inferences. When a child learns to read and write he already has a certain mastery over the spoken language. How has he acquired that power? What means has he at his disposal to improve his skill? And, in addition, of what is this spoken language composed? It is intelligible, but does it not in fact depend upon processes very different from those required for the written language?

We have also seen that as soon as children learn to talk they feel, even though they may only be uttering single words, that they are using sentences. The meaning which they give to them is not the same as that accepted by adults; it is only the circumstances in which they are said, the gestures which accompany them, the intonation given to them which make the meaning clear. In the same way children understand what adults say to them with the help of these external aids. Nevertheless, they gradually learn to analyse their thought which is at first closely connected with the physical world around them and is rather confused and generalized. Then groups of words connected grammatically collect in their minds, formal topics develop, which, when the mind so wishes it, come forward as a whole, calling on words to play their part, and somewhat haphazardly these topics are connected one with the other. Use is made of gesture, tone of voice, and the general context when words fail. So single words emerge slowly from the phrases in which they are used; they emerge as children develop intellectually and as they become more able to analyse the words they use.

A 6-year-old child is often still incapable of such verbal analysis, and his language is still full of concrete elements. Moreover, he is

inclined to give to the words he does know—or appears to know—a particular meaning connected with the circumstances in which he first learned them, sometimes also it has some connexion with the actual form of the word, with its sound perhaps. This special meaning will only gradually disappear as he begins to know better the general meaning of words, and as he becomes sufficiently developed intellectually to understand more complex sentences.

So this is the point from which we start. And this is our ultimate goal. We ought to be able to read with such ease that as soon as we see the first words of a sentence we anticipate the general form of the sentence and the part played by each of the words we have seen and which form the whole. We are able to do this thanks to the form and position of the words; we know whether they are nouns or verbs; we have intuitive knowledge of their usual role; we are helped by punctuation, in brief by a whole collection of signs which surround words with a complex network of associations, which, although unconscious, is none-the-less essential. We can only understand a sentence if, when we first see the words, not in their apparent isolation but surrounded by this complex network, we decide what we think the sentence is going to mean thanks to a few essential words. The rest of the sentence either confirms us in our belief or puts us right. As far as we can judge, a similar process takes place when we try to put our thoughts into writing.

The difficulties involved in learning how to deal with the written word are, therefore, not simply a matter of learning a new technique. The child must somehow be able to free his mind from the attendant circumstances and must be able to analyse his thought. He must succeed in replacing all the concrete connexions which give meaning and expression to the words he utters or hears by an unconscious mental image called into being solely by signs.

The teaching of language is therefore dependent on the intellectual progress made by the child. Since language also expresses feelings, the growth of the child's personality also affects the teaching. So, above all, we must try to awaken and foster the personality of children. In addition, when teaching the written form of a language we must never lose sight of the fact that the child is already in possession of the essential elements of the language, namely its spoken form. If we make use of purely formal methods peculiar to the written language we shall make the child feel that we are teaching him a language quite different from the one he knows and uses every day. This obviously would have great drawbacks.⁸

⁸ Most of the examples and arguments put forward in these two first parts of this article have been taken from Roger Thabault, *The Child and the Written Word*, Editors Delagrave, 15, rue Soufflat, Paris, 1945.

Changes Brought About in the Language by the Use of Audio-visual Methods of Expression

Schools of all sorts and universities in many countries of ancient civilization have considered in the past and doubtless still consider that one of their most important functions is to give children and students an increasingly comprehensive and profound knowledge of their native language and of its literary masterpieces. It is not a question of training specialists but of letting young people come into contact with the great minds of their native land. Teachers find it essential to make use of the written word; all those who make use of and teach the language of any country which has been civilized long enough to be rich in literary masterpieces are very attached to it.

Of recent years new methods of giving information and imparting knowledge have appeared and have become accepted media in schools. These include radio, television, and films. A new language is being developed, a spoken language which is often helped by pictures. In what ways is this language different from the usual spoken language, and from the written language? Can and must the schools consider it as a foreign language? Can we forecast to what new form of civilization its use is leading us?

One fact cannot be disputed: the language of the radio, more than the written language taught at school, doubtless even more than the language of the press, makes its appeal to the masses, and takes into account the mediocrity of a large number of listeners. The words spoken on the radio come from a distance, are not supported by any visual aid, and to be understood must remain simple and not too subtle. Even cultured broadcasters, even those who take the trouble to write down what they have to say are careful to express themselves in such a way as to be understood by the majority of the listeners. If there are any difficulties they point them out and show them from various angles. This bears no similarity to the efforts of a writer who tries to clarify his own ideas, to elucidate his message, and who expresses himself without thinking about his readers. There is little similarity between the language of Shakespeare or Racine and that of the best broadcasters. An important rule must be observed by those who wish to speak on the radio: if you wish to be understood you must use simple language. This holds good not only for the masses but also for the cultured few. If one reads a difficult passage and at a first reading the meaning is not perfectly clear nothing is easier than to read it again, to ponder over it, and then to continue reading once full understanding has been achieved. But once a word has been spoken on the radio it has gone. If one does not understand immediately, one will

not be able to understand it at all. Undoubtedly the delivery of those who speak can help the listeners to understand; and good broadcasters, well aware of this fact, know just how to make important words stand out and how to make grammatical constructions clear. But even their skill would not be enough to make a difficult passage intelligible.

Furthermore, not all broadcasters read from a carefully prepared script. The language used by some is not very polished. Of course, this may be because they have instinctively adopted the somewhat loose style used in everyday speech, because in this way what they have to say seems more alive. They do not try to make use of the exact word, but seek for those which are graphic and colourful even if they are colloquial. They often use repetition. Colloquialisms, exclamations, interjections are all to be found. Sometimes they launch out into a complex sentence, in the middle of which they get lost, so they stop abruptly, sometimes turning into a joke against themselves the fact that they need to go back to the beginning.

Their aim is not to speak correctly, but to awaken and sustain their listeners' interest. It is for this reason that more and more often abstract subjects are presented in the form of dialogues, and discussion occupies an important place in broadcast programmes. An attempt is being made to reproduce the rhythm and vitality of ordinary conversation.

All this is purely oral; an adult can easily understand and gain information by listening to broadcast programmes as long as they are dealing with subjects with which he is himself familiar. Broadcast programmes intended for children must be prepared and adapted with the utmost care if they are to be of use. Elsewhere⁹ an account has been given of the results of an experiment concerned with children aged between 7 and 8, divided into four different groups of equal ability. The first group listened twice to a recording in which a well-known actor recited with a great deal of expression a fable by La Fontaine, "The Cobbler and the Financier". The second group of children listened while a pupil read the fable twice and then they read it through to themselves. The third listened while a teacher told them the story. The fourth group listened to someone reading it with expression, followed by a dramatic representation of the story.

Nobody who listened to the recording had understood the fable. Two girls out of five of those who had read the fable to themselves after listening to one of their number reading it without great expression had more or less understood its meaning. Three out of five of those who had listened to the teacher reading it and acting it at the same

⁹ *Ibid.* pp. 46-9.

time had understood the fable almost perfectly. But it was with the children in the group who had listened to the teacher telling the story of the fable that the greatest success was achieved. This simple experiment would seem to show that intonation alone is not sufficient to make children understand a fairly difficult passage, that some dramatization—although this produces another problem—helped by the personal magnetism of the teacher is necessary.

The Spoken Word and Modern Conditions

Television and films bring together pictures and the spoken word. This is another language; the expressions on the actors' faces usually dispense with the need for the psychological analysis which is indispensable in books. It is unnecessary to add that children love television and films. As a language it has much in common with the one they have always been familiar with and by means of which they have learnt to speak.

The time spent on this type of language which is dependent on mechanical devices is taken away from that which used to be devoted to learning to read and write. Children read far less than they did. The only type of book which children under 14 or 15 read willingly is that in which the story is told by means of pictures accompanied by explanations often couched in colloquial, incorrect, or even vulgar terms.

In consequence of this fact alone the written word has much less influence than in former days. Remember, too, that nowadays the telephone makes it unnecessary to write a letter; a dictaphone makes it possible to give a written form to sentences which have been spoken. We are obviously entering a new era in which the spoken word is becoming much more important than the written word.

In its turn the written language is changing. As new techniques develop, many new terms must be introduced. Who would have thought even twenty years ago that the term 'to land' would need to be supplemented by some word meaning 'to reach the moon'. These new terms are often international. Industries often impose along with their techniques the vocabulary of their country of origin. Many of the terms used in the film industry (producers, stars, gags) are Anglo-Saxon in origin, as are those used in the oil industry. The Russian word 'sputnik' must surely have been adopted by every language in the world.

The need for speed so characteristic of our time makes us tend to shorten long words. In the general bustle and hurry of modern life some words have either lost their heads or their tails. Cinematographic has become *ciné*, the metropolitan railway is called the *met*, a bicycle

a bike. This is the age of initials. The London Passenger Transport Board is called the L.P.T.B., Television is T.V., the Trades Union Congress is known as the T.U.C.

Even the construction of sentences reflects this feverish desire for speed. The sentences written by authors of repute are becoming simpler and shorter. One has only to compare the sentences written by Françoise Sagan, best-seller of the present day, with those written by any French author of the nineteenth century who was also interested in the analysis of sensual passion to see this difference clearly. To make up for this, authors seek striking, condensed expressions. This is true also of the style of those journalists who devote sufficient time to thinking about what they are writing and of the form they give to their thought. It is especially true of the headlines given by editors to newspaper articles. Foreigners with a fair knowledge of English sometimes find it impossible to understand the headlines in American newspapers until they have read the articles. On all sides we find slogans which catch the eye and urge people on to action.

However, it takes some time to find the exact expression, and efforts have to be made to analyse what one wants to say and this many authors are unwilling to do. In addition more and more of them dictate their books instead of writing them. Examples abound of a slipshod, involved style, full of tedious phrases in which the writer is obviously seeking a more exact form for what he has to say, and goes from one word that is not quite right to another, and perhaps finally lands on the right one.

Technical Language

Technicians alone when they are expounding some section of their specialized knowledge are precise, concise, and avoid with care words which are not absolutely correct. But if their style contains some of the qualities shown by great writers, nevertheless the increase of precision shown in the vocabulary proper to each technique makes it difficult and sometimes incomprehensible to non-specialists. The average man of general culture finds it more and more difficult to understand a man concerned with some specialized occupation such as electricity when he gives details of some piece of work to be carried out in his home. It is becoming less and less easy for people engaged in different trades and occupations to communicate with each other, both because their language is becoming more and more specialized, and because when they talk of subjects outside their speciality they are content to use approximations. This is especially true when they talk about generalized ideas and feelings.

The essential point is this. In a civilization depending more and more

on machines and on the masses, a civilization in which everything on every side is constantly being speeded up, the spoken word is all the time becoming more important as the written word loses ground. The written word, for which thought and time are essential, is more and more neglected except in the realm of technical language, which is becoming more widespread in specialist groups who are not divided by national boundaries.

We are on the threshold of a new era in which technical knowledge takes precedence over culture, in which the men with a reputation for great knowledge are no longer those whose education was based on the thought of the writers of antiquity, but those who are acknowledged masters in their specialized technical spheres. Schools and universities in Western countries such as France which are even now only allocating a small share of their time to audio-visual methods and to the spoken word, and are making desperate efforts to uphold an educational system based on the written word and on a knowledge of the masterpieces of literature are fighting a rear-guard action doomed to failure. In France all teachers complain of the poor standard reached by their pupils in their own language. They make comparisons between what their pupils write and read to-day with what their predecessors were able to write and with what they enjoyed reading thirty or forty years ago. This comparison is not to the advantage of the child of to-day. We live in a new world and we must adapt ourselves to it. The problem we must solve is how to find in the way of thinking and expression imposed by a new type of civilization the humanities which will allow men to understand each other and live in friendship.

This is a difficult problem and one which will find no solution until the teaching of the grammar of the written language is given new interest by being more closely connected with ordinary speech, until we give up the idea of making the written word the only means of communicating information and knowledge to our pupils. We must throw open the doors of all our schools to audio-visual methods; we must make every effort to understand, explain, and teach at the same time as the accepted rules of grammar this new system of communication embracing colours, shapes, and rhythm, to all of which children are most responsive. Thus, little by little, schools will help in the gradual blossoming of a nascent humanism which is cautiously finding its way through a maze of technical knowledge, pictures, and movement. It will be able to bring to its aid all those elements of traditional humanism which remain essential.

ROGER THABAULT.

The Impact of New Media on the Teacher's Work with special reference to Britain

SINCE the Reformation educators have been seeking a proper balance in the work of schools between provision for learning by 'direct' experience and provision for learning vicariously. The problem still plagues teachers, though the new media offer vastly improved possibilities for the mediation of vicarious experience to children in school. Proper use of these media enlarges enormously what H. G. Wells called the effective "range of intercourse" between children and their world. Teachers who at first extended no more than grudging welcome to the new media have now accepted them as friendly allies and as strikers of the vivid image.

Problems of Organization

A teacher who wants to use ciné film to help him with his work to-day can obtain it with much less difficulty than he could have done yesterday. The Educational Foundation for Visual Aids, established in 1948 as the executive of the National Committee for Visual Aids in Education—a body sponsored jointly by the U.K. Ministry of Education and the local education authorities to promote the use of new media in schools—provides teachers with an eight-volume catalogue of approved films produced by a variety of companies on behalf of the National Committee and of industrial, welfare, and educational organizations. Films appearing in the catalogue are available through the Foundation's library, and a special hire service now greatly facilitates distribution of these films to schools in areas controlled by local authorities which pay annually a compounded hire charge. Commercial libraries also rent films to teachers at charges varying with running times and types—whether sound or silent, black and white or coloured. Firms which have sponsored production of educational or teaching films will often lend them free of charge.

Simplified and centralized hiring procedures do not entirely relieve teachers of a major source of difficulty. Teaching films are now so much in demand that users must book their requirements weeks or months ahead—and where is the teacher in a British school who can predict with certainty that he will have reached a given place in his syllabus in, say, six weeks' time? How then can he be sure that the

film he ordered to help him make certain points will in fact arrive on his desk just when he most needs it? Teachers who integrate film into their courses, on occasion welcome the services of small regional film libraries, because they can usually borrow from these at short notice, often indeed overnight. Many large urban education authorities now maintain such libraries for the use of schools in their areas.

When a teacher has hired a film, as he can do now without much difficulty, he still has problems to face. By this time, most teachers have discovered a *modus vivendi* with problems of inadequate black-out, necessity for shifting classes about the school to make a blacked-out room available, setting up what is often cumbersome apparatus, siting speakers and rearranging seating. In addition, in some areas where one projector must serve several schools, a teacher faces the problem of providing a projector in working order at the appropriate time. Two consequences issue from the make-shift solutions which teachers must often provide to these and allied problems. The first is that the standard of presentation of classroom film is often distractingly poor to a cinema-sophisticated audience. The second consequence is that showing a film may have about it a sense of occasion which sometimes prevents it from taking its proper place as an integral part of a course of lessons.

Methods of using Film

In spite of these problems, however, many British teachers are to-day using film most effectively in their work. Where movement is an important ingredient in their *docenda* they recognize in film an effective ally. They are aware that classroom films which run between ten and fifteen minutes now cover a wide range of topics in general science, social studies, and physical education. With the aid of such films they can bring into classrooms the raw materials for lively and 'realistic' experiences. Teachers using films of this kind do not usually regard their showing as poor substitutes for 'direct' experiences, since they know that the lens of a camera can often be sited so as to reveal processes, events, and objects otherwise concealed from human eyes. The guarantee that most of these films will prove effective aids is that practising teachers, experienced in work with film, are usually appointed through the Educational Foundation for Visual Aids to serve as advisers with production teams.

Each teacher develops his own method of using film—as indeed he does of using other aids. As his experience accumulates he becomes increasingly alive to the different responses evoked by the same film from various classes of children, and he learns to adjust his approach accord-

ingly. But, no matter what method he usually employs, a teacher will always provide a verbal introduction to the presentation of a film. Normally, this takes the form of a brief résumé of work leading up to the film lesson together with an account of points in the film which the audience should most particularly watch for. He may then show the film, stopping it to elaborate significant points and to clear up difficulties as he judges they arise. A single presentation of a film so used is likely to occupy an entire teaching period. A majority of teachers to-day, however, show a film through for the first time without interruption. At the end of that showing they spend some minutes discussing it with their pupils, and then run it through a second time in the same teaching period. During the second showing the teacher may stop the film occasionally, if he has time, to gloss points of special difficulty as revealed by his recent discussion with his class. Films other than ten- to fifteen-minute teaching films demand somewhat different treatment. A teacher using a two- to five-minute study film (such as *The Jack Plane*) may show it repeatedly with little or no comment, especially if natural sound accompanies it. A single uninterrupted showing of a background or inspirational film of twenty-five to thirty minutes, with introduction and short discussion of it, must necessarily occupy the whole of a teaching period.

No matter how diverse the methods they employ in showing film, teachers without exception agree with William James (1) that there can be "No reception without reaction, no impression without correlative expression. . . ." Film, in fact, should serve as a learning aid rather than as a teaching aid. It should, in the words of one of Her Majesty's Inspectors, (2) "ask questions without providing too ready answers. It should lead to discussion rather than present potted information. . . [and] above all, it must not have a mere hypnotic influence, but must inspire thought and discussion [if it is to] fulfil its true educational purpose". Work based on the lesson of which a film was part would naturally take into account pictorial material presented and would not therefore always take the form of essay writing. A geography film might suggest models to make or friezes to paint; a science film might serve as a starting-point for further experiments; and an industrial film might suggest a visit to a local factory as a possible follow-up.

Filmstrips and Wall charts

Filmstrips have much wider currency than film because they are altogether more 'amenable' as an aid. Strip projectors are not costly and almost all schools now have their own. A strip projector is light to carry, easy to mount, and simple to operate. Because a picture on 35-mm. strip is, relative to a picture on 16-mm. film, a large one, a short

throw will provide images plenty big enough for a class to view comfortably. Again, because the throw can be so short, teachers more frequently employ some form of rear projection when they are using strips than they do when they are using ciné film. Further, because strip projectors can be used with short throws, they can be made to provide bright images on hooded screens in well-lit rooms or on open screens in semi-darkened rooms. Just as important as these practical considerations is the fact that a great literature of filmstrips already exists, and many schools have serviceable libraries of their own, so that a teacher can usually get the strip he wants at the time he wants it without difficulty. Many local education authorities also maintain collections of strips from which teachers in their areas can borrow without cost or fuss.

Ease of presentation and distribution makes filmstrip an amenable medium. A teacher using a strip can forget his apparatus and concentrate on what he wants to teach. He can show selected pictures at any speed he thinks appropriate. Working in no more than semi-darkness he can establish firm *rapproch* with his class, and can approach his subject as a developing situation seems to demand. Yet teachers are still to be found who seem impelled "while they have the projector set up, just to run through" many more frames than their pupils can possibly look at with profit. Courses on visual aids, extensively provided a few years ago, tended to concentrate so much on techniques of projection that they failed to provide adequate grammatical and syntactical bases for the understanding of visual 'language'. The result is that many teachers to-day make much less than they could do of statements which compose the presentational discourse of pictures on a screen.

Many teachers now have cameras which will take 35-mm. direct colour reversal film. When he buys film of this kind the photographer pays for processing which includes the mounting of each picture transparency as a miniature (2 in. by 2 in.) slide. Interest in colour photography is growing rapidly, and many teachers have already built up fair collections of miniature slides suitable for use in strip projectors fitted with slide carriers. Such collections deal mainly with geographical, historical, and wild-life subjects. Now while some of these slides will be amateurish in a pejorative sense, they will be personal records, and as such they may well be more adequately used than corresponding professional but impersonal products.

Filmstrips cannot be made to produce, as ciné film can, an illusion of movement on a screen. Does it then follow that a strip is an inferior teaching aid where demonstration of movement appears to be essential—as, for example, in teaching technical handicraft skills? Recent research like that of Laner and Vernon (3) suggests that "the best

method" of teaching such skills, using visual aids, was not to show ciné film, but to "display before the learners a filmstrip or a series of pictures or clearly drawn diagrams, and [to] let the instructor explain the more complicated stages and answer the questions of those in doubt". Once more, it appears, the common-sense answer might not make such good sense after all!

Wall charts have this advantage over filmstrip pictures—that they can be displayed for as long as a teacher or his pupils require. They have, too, the advantage that they can be used in full daylight, and, if necessary, therefore, built into practical demonstrations. Teachers use them nowadays to teach elements of skills—as in sewing—to convey information—as in general science—or to organize factual information into concepts—as, for example, in teaching the meaning of the feudal system. To serve these purposes teachers often make their own charts. Not infrequently these charts are as well executed as they are well designed. Nowadays, however, a number of commercial producers employ a *montage* technique in making charts which would be beyond the competence of most teachers. They may incorporate in the same chart half-tone and coloured pictures, line drawings, graphs, maps, self-evident symbols, and letterpress. Unhappily, command of this technique does not guarantee the quality of the charts as teaching aids. Many are, in fact, overcrowded with items too small and detailed for classroom use, though some might serve as material for individual study.

It is presumably because some commercially produced charts are so crowded with information that their publishers provide descriptive booklets to accompany them. In some cases this would seem to be a confession of failure; a chart as a visual aid should be judged first by its capacity for making clear statements of fact and their relationships in visual terms. True, producers may be greatly tempted to offer complex rather than simple charts, for both are costly to produce and potential purchasers might be expected to consider the more complex better value for money. The correct valuation here, however, is surely that offered by Otto Neurath who was of "the opinion that a simple picture kept in the memory is better than any number of complex ones which have gone out of it" (4).

Role of Museums and Exhibitions

The *Visual Aids Yearbook*, 1958 (5), lists forty-nine museums in Britain which now offer special facilities for study to teachers, classes, and individual children. Curators generally now recognize that museums have an important role to play in the education of the community at large, and those who can command the resources to do so will arrange on request special exhibits for school parties. With this

possibility in view, those in control of a few of the bigger museums employ teacher-curators, and set aside special cloakroom, lunch-room, and lecture-room facilities for organized school parties. A few—a very few—museums or departments of larger museums cater almost entirely for younger visitors. Such museums welcome children whether they are in school parties or have come on their own initiative. A number of local authorities now support school museum services which will lend exhibits to schools in their areas. These are clearly of greatest service where population is sparse and scattered, and where on that account visits to museums must involve much travelling. A museum loan service may then be the only way of supplying to schools certain objects, specimens, and models as teaching aids. The services of all three types of museum—those which will provide special exhibits, those which cater specially for children, and those which lend exhibits to schools—have been welcomed by teachers and pupils alike, and, apparently, wherever 'free-time' museum clubs have been organized for children, "they [have been] an almost embarrassing success" (6).

Reasons for the welcome accorded to these services are not difficult to find. Just as children can be stirred by the fact that a recently returned traveller speaking to them in school about his journey has *actually been there* (and, by implication, that *there* must exist apart from the atlas), so they enjoy handling objects which provide a genuine sense of contact with distant times and places; they too, by implication, must *actually have existed or exist*. Again, an object is corporeal as no representation of it through a single sense can ever be, and a teacher watching children handling exhibits may well wonder why in his previous teaching he has so undervalued the sense of touch. Yet raw materials for experiences even as valuable as these should not be offered indiscriminately. They are perhaps most effectively offered when they can be fully articulated with current work in school. Teachers must learn to use exhibits in school or museum as they have come to use film—on appropriate occasions. Viewing and handling should also be so contrived as to suggest to children concerned that they might make, collect, date, describe, and display models, sketches, specimens, and objects of their own choosing. The value of the museum visit, like the value of using other visual aids, may reside as much in the *doing* which follows it as in the actual *viewing*.

Integrated use of Visual Aids

Each kind of visual aid has its merits. A number of these aids could therefore be combined in such a way as to reinforce one another in the illustration of broad topics. The Ministry of Education showed how effectively this might be done in the so-called "visual units"

which it commissioned the Central Office of Information to produce between 1943 and 1948. These units combine as appropriate sound and silent film, filmstrips, wall charts, wall pictures, models, and illustrated handbooks. For example, the unit on *Local Studies*, which records the work of children engaged on a local survey, includes a sound film, three silent films, a cinépanorama, a set of eight coloured filmstrips, eight wall charts, and an illustrated brochure. Teachers interested in visual aids regret that commercial producers have not yet been much attracted to enterprises of this inclusive kind. At the moment, teachers must match as best they can filmstrips from one source with films from another, and with wall charts from a third.

In British junior schools the practice of encouraging children to draw, paint, and model in connexion with their other studies is one of long standing. More recently teachers in secondary schools—and notably in secondary modern schools—have adopted the same practice. Clearly, they have not done this because they think that children living in a world which now makes extensive use of visual ‘language’ should learn to write it as well as learn to read it. Teachers in ‘modern’ schools have done so rather because their pupils have been categorized as dealing “more easily with concrete things than with ideas” (7). Some teachers in these schools undoubtedly agree with John Ruskin that “for one man who is fitted for the study of words, fifty are fitted for the study of things”. (8) In consequence they have devised appropriate practical curricula and have encouraged pupils to record their work in visual and concrete forms. Many more teachers, however, appear to have accepted the practice of drawing, painting, and modelling to record work in school studies as a *pis aller*. “Our pupils can’t write much, so let them draw and make models—that will keep them quiet anyway”, seems to sum up the attitude of these teachers. Happily, their negative attitude towards ‘visual-record’ making is now giving way to a more positive one.

Authoritative justification on educational grounds for the practice of ‘visual-record’ making has not yet been published here, but what can perhaps be counted its sovereign virtue was isolated long enough ago by English educationists like Adams (9) and Happold (10). More recently, H. R. Cassirer (11), now Head of Television for UNESCO, has expressed it in the aphorism—“what is not understood clearly cannot be drawn simply . . . if”, he continued, “we wish to check whether a class has really understood a subject, why not ask it to put it down graphically?” The effect of doing so is the same as that of asking children to translate from one language into another; before they can do that successfully they must be clear what the words they are to translate really mean. In the same way, before they can adequately

manipulate even the iconic symbols of graphic 'language', children must, presumably, see clearly through the matter they wish to communicate visually. Increasingly, teachers are finding that this and other demands of 'visual-record' making can constitute for many children a rigorous mental discipline. They are discovering, too, that this is a practice which brings rewards in increased interest and in more thorough assimilation of school experiences.

The *Orbis Sensualium Pictus* (12) was published a little over three centuries ago. Since that time, many educationists have advocated the use of visual aids in teaching, as Comenius did, on the grounds that the "foundation of all learning consists in representing clearly to the senses sensible objects", for what after all are words but 'garments' without bodies, 'shells and husks' without kernels? Visual aids properly used are indeed a counter to that verbalism which seems to be endemic in schools. "For what do they teach, these pedagogues?" asked Rousseau, "Words, words, words" (13). Yet pictures are poorly suited to conceiving and conveying causal connexions, relationships, activities, changes, and a whole teeming world of ideas. To communicate these, men must "resort . . . to the more powerful, supple and adaptable symbolism of language" (14). In fact, so important is language in all human affairs that teachers in every kind of school recognize it as their duty to educate their pupils to the highest level to which they can attain in the use of words. It is here that broadcasting has one of its great contributions to make to school work, for it appears to "affect speech markedly for the better", may encourage reading and composition, enlarge vocabulary, promote "a habit of decent and polite criticism" (15), and provide a training in attentive listening to words well used.

National Organization

Broadcasting to schools in England is controlled by the School Broadcasting Council for the United Kingdom. Similar Councils for Scotland and Wales commission additional national programmes of their own and appoint members to the United Kingdom Council. The Ministry of Education, local education authorities, inspectors, and teachers are well represented on each of these Councils. To help and advise them the Councils have four programme sub-committees, one each for infant, junior, secondary modern, and secondary grammar schools. Most members are practising teachers, and they are carefully selected from all parts of the kingdom. The work of translating policy decisions and proposals made by the Councils into programmes ready for broadcasting is entrusted to the B.B.C. School Broadcasting Department. This department, one of many in the B.B.C., is a distinctive unit; yet it can

count, as other departments do, upon the support of the entire organization of the B.B.C.

Those who prepare material for transmission by any of the new media encounter a common difficulty—that they have no direct *rapprochement* with their audiences. In Britain, the School Broadcasting Councils adopt a number of measures to counter this difficulty. First, they employ their own education officers who work from various regional centres. These officers spend much of their time in classrooms listening to school broadcasts and discussing them afterwards with pupils and teachers. They report their findings and suggestions to the Education Department of the B.B.C. Again, a representative cross-section of teachers, using a particular series of broadcasts in different areas and in different types of school, undertakes to send short, weekly reports to Broadcasting House concerning the reactions of their pupils. Sometimes, too, education officers of the School Broadcasting Council convene teachers' meetings in their regional headquarters. At these meetings experienced users of a series of school broadcasts discuss frankly where the series succeeded and, if it did not, where it failed. Reports of these meetings also reach Broadcasting House. Taken together, these reports from education officers, individual teachers, and teachers' meetings put into the hands of those preparing programmes (notably the programme assistants) a substantial body of evidence concerning the reactions of children to their work. These efforts to maintain contact between schools and broadcasts represent "the most distinctive feature of school broadcasting in Britain. No broadcast," it appears, "is transmitted but that a picture of its reception by the children comes back to Broadcasting House; and it is long term in that this evidence is used by the School Broadcasting Council in its working out of programme policy and by the B.B.C. in its programme planning" (16).

Heads of junior and small rural schools in which most teachers are class teachers have no difficulty in rearranging time-tables to accommodate broadcasts they want to use. On the other hand, heads who co-ordinate the work of specialist staffs, as most heads of secondary schools do, must make complex time-tables, and they must always encounter some difficulty when they come to fit a series of weekly broadcasts in with other school work. The Education Department of the B.B.C. helps them to make light of this difficulty by telling them—indeed, by telling all heads—well in advance about proposed programmes. Early in March the department distributes its provisional time-table for the school year which begins in the following September. In early June head teachers receive copies of an annual programme which supplies details and dates of broadcasts. Shortly afterwards,

those who register as proposing to use certain broadcast series receive free copies of Teachers' Notes for the appropriate series together with display copies of time-tables for all broadcasts to schools.

In Britain, broadcasts to schools have never taken the form of 'prefabricated lessons'. A recent writer has insisted, *per contra*, that broadcasts to British schools should properly be called 'experiences' which children and teachers share. They do, indeed, bring into classrooms the voices of great men and women, of travellers and explorers. They offer performances of music, drama, and poetry by famous artists. They establish contacts with the world at large by eye-witness reports, interviews, and 'documentary' techniques. They use dramatization and other devices to create realistic illusions of 'being there' on historic occasions in the past. In these and in many other ways broadcasts make accessible to children and teachers possibilities for experiences which would otherwise be denied to them. Only by misuse of words could such broadcasts be called lessons and, *a fortiori*, 'prefabricated lessons'.

Teachers' use of Broadcasts

From training and experience teachers know that children who are to make full use of broadcasts must be well prepared for listening to each one. A teacher who has geared his lessons to a particular broadcast series is, in a sense, continually preparing his pupils for listening. Another teacher who is using only two or three items in a series—perhaps because they fit fairly well into a pre-arranged syllabus, perhaps because they appear to be of particular interest—may need to give a few special preparatory lessons. At all events, in the short term, teachers prepare children for any particular broadcast by seeing that they have at hand the books, atlases, or pamphlets advised by the Teachers' Notes provided for the series. Usually, a teacher listens quietly with his pupils to a broadcast prepared for in these ways. He listens with them partly to avoid distracting attention from the broadcast, partly because he cannot know in advance exactly what the content of the broadcast will be. In the fullest sense, then, a teacher does share the experience of a broadcast with his pupils. When the broadcast is over, the teacher shapes material which it provided as he thinks fit. But here he should show 'teaching tact' in the late Dr. Percy Scholes' sense: he should not do violence to the material or spirit of the broadcast merely to make *his* points. He must not be "prescriptive, categorical, interfering. . . ." He must be something of an opportunist following tactfully where interests of the children seem to lead. After an experience of high emotional intensity or aesthetic rapture,

he may well do nothing more than leave his pupils to savour in silence the fading echo of the broadcast word.

Often, however, the teacher is able to follow the broadcast up much as he planned. Immediate follow-up may take the form of discussion and partial recapitulation of broadcast material accompanied by some note-making or other writing connected with it. Not infrequently the follow-up will occupy some hours spread over the week of the broadcast, and sometimes a wide-ranging study may build up throughout a term or even a year around a broadcast series. In fact, the teacher is likely to conceive his job as that of spreading interest engendered by broadcasts in as many profitable directions as possible. He may, therefore, encourage his pupils to dramatize some appropriate incident, make models, paint friezes, conduct experiments, collect and arrange specimens, or visit places of local interest. Even so, many teachers affirm that broadcasts are for some children seminal in unexpected ways, and that their value ought not, therefore, to be adduced only from the results of overt and deliberate follow-up.

On the whole, British teachers find broadcasts most acceptable accessions to their resources, and this results largely from the care which the School Broadcasting Councils take to consult practising teachers when planning programmes. But this should not suggest that the Councils provide only what most teachers appear to want. They can and do design programmes around growing points in educational practice, and in this way they may, over a period, substantially influence curricula. Broadcasting may, in fact, be a medium well suited to pioneering in this way, for while it is a less amenable medium (i.e. less under direct control of the teacher) than others so far discussed in this article, it may be more useful than they are in pioneering, for its services to schools are cheap and its products evanescent. Schools taking experimental series do so at negligible cost to themselves, and broadcasts, once made, are no longer there demanding to be used over and over again until they are worn out.

Paradoxically, a much-admired feature of school broadcasting in Britain is quite inaudible. This feature comprises the illustrated pamphlets designed to accompany various broadcast series. Each year the Publications Department of the B.B.C. sells more than seven million copies of these, priced at a few pence apiece. A pamphlet is usually arranged to provide for each talk in the series it accompanies, a short letterpress introduction and a number of 'necessary' and 'desirable' illustrations. Many of the photographs used are in black and white, but over the last ten years reproductions of coloured photographs have added greatly to the attractiveness of the pamphlets. In any one pamphlet acknowledgments to institutions of all kinds the world over

for permission to reproduce photographs are likely to number a couple of dozen—a fact which shows what care has gone into its production. Indeed, so good are the pamphlets of their kind and so cheap, that many teachers who have no intention of taking the broadcasts they illustrate still buy them for use in a variety of classroom contexts.

The Gramophone and Tape Recorder

Among the more amenable instruments at a teacher's disposal to-day is a gramophone, and almost all British schools now have one of some kind. Perhaps the most important of many uses which a teacher can still find for a gramophone is the one for which it was first introduced into schools—as an aid to teaching musical appreciation. A teacher of music now has an extensive range of recorded orchestral, instrumental, choral, and vocal music from which to select illustrations for his lessons. Usually he will keep a stock of favourite records in his own school, but often he is able to supplement that by borrowing from a record library maintained in an audio-visual centre by his local education authority. But, leaving aside lessons in appreciation, whenever music is required in school a gramophone and records can be useful—for example, at school assembly, on some festive occasion such as United Nations Day or Commonwealth Day; or for providing incidental music at school concerts or plays. Again, a gramophone is often used to accompany a percussion band, or to supply music for folk dancing or for games played by younger children. As an instrument in its own right a gramophone may provide *petits concerts* for class or school.

A teacher of a modern foreign language should find in a gramophone and appropriate records an almost indispensable ally. No Britisher, brought up to use English as his only language, can hope to learn another so as to speak it exactly as a native would. The pupils of a Britisher brought up in that way can do no better than attempt to imitate as closely as they can their teacher's own approximation to the language concerned. But the gramophone can bring the voice of a native speaker into the classroom to serve as their model. Further, a gramophone will repeat words and phrases accurately and untiringly, so that a class or an individual can learn pronunciation and speech patterns by listening to them over and over again. Disadvantages of using a gramophone as an aid to the oral teaching of a language are indeed difficult to discover. Yet strangely, it appears to have been little used in teaching English, a language foreign to many English children. Recordings of prose, poetry, and drama beautifully spoken by actors of merit might with advantage be more used here. Listening to some of these recordings might serve both to improve speech and to enhance enjoyment and understanding of aspects of English literature.

Tape recorders are comparatively recent accessions to the battery of modern teaching aids, and as yet many teachers and most children seem over-conscious of them as machines. When this phase has closed and tape recorders are accepted as a normal part of school equipment, teachers will be freer to explore their not inconsiderable educational potentialities. Indeed, many teachers are already beginning to do so. Publishers have provided a number of short plays in the form of 'radio scripts' designed to be read and recorded by children. These appear to have engendered much interest among those concerned with their production, partly because children enjoy 'acting in words', partly because the plays call for a number of off-stage noises which those not reading parts will go to some lengths to produce and record. From reading published plays to writing one's own is a short step, and some teachers have already employed recording as a 'creative medium'. They have encouraged their pupils either to write scripts or to rehearse, record, play back, improve, rehearse, and finally record plays without committing them to paper at all. Teachers have also discovered that children will lavish time on writing accounts of, say, school events if they know that these are to be recorded and played back to their classmates.

At present tape recording is the only way of letting a child hear his own voice as others hear it. Therefore, to play back to him a recording of something he has read or spoken into a microphone may convince him as nothing else could do of the peculiarities of his speaking voice. Consequently, a tape recorder is an invaluable aid in lessons specifically devoted to speech training; but to play back to a child a recording which he made for some purpose other than speech training may still reveal defects which call for remedial action. Some teachers themselves comment on the recorded speech of their pupils; others encourage children to criticize their classmates, and this practice is defensible on the grounds that children are often more attentive to the criticisms of their peers than to those of their teachers. However, some children react strongly at first to hearing themselves speak or sing, and they in particular must not be exposed to ridicule. Teachers who use recordings to register at intervals the reading of backward children—as some do who consider reading tests inadequate measures—must thus ponder most carefully before they play such readings to an entire class.

Television in Schools

In 1952 the B.B.C. and the School Broadcasting Council conducted the first of a series of experiments on the use of television as an educational aid. Much discussion has since centred round the question:

"Should television provide 'prefabricated lessons'?" The question was in part prompted by the fact that a televised person appears to establish direct and easy contact with his audience. Could such a person take the place of a teacher? The School Broadcasting Council's view, doubtless coloured by experience of radio as an educational aid, is that television should provide teachers and pupils with possibilities for experiences which would otherwise be denied to them. It should, for example, bring eminent men and women into schools, near and remote, and transport desk-bound children across deserts and through mountains in observation cars. The true function of television, it appears, is not to replace the teacher, but to put at his disposal a means of enriching his *docenda*. A present shortage of teachers, notably of science, could however modify this function, for television might successfully provide expert *demonstration* lessons in the physical sciences.

A second much debated question concerning the uses of television as a teaching aid has been: "What can TV do that sound film cannot do?" A recent report on *Schools Television* published by the Scottish Educational Film Association has pointed out that "in some cases, at any rate, the sound film [would have been] at least as good" a medium as television for presenting certain programmes (17). The report, a slender one, added that later programmes in some series "became more television . . . as the producers mastered the technique". This suggests that television is, as many have asserted, a medium in its own right, though its users have still to map its limitations as well as explore its possibilities. Directness and immediacy are apparently the two characteristics which most distinguish it from film. It also lends itself to visual eclecticism; the broadcaster moves easily between diagram, model, apparatus, ciné film, and still picture as his subject requires. Again, television, like sound broadcasting, can mount a series of articulated programmes which build one upon another with cumulative effect.

Characteristics peculiar to varieties of audio-visual media are less important matters to most teachers than the facility or difficulty of getting them and using them. Television, like sound broadcasting, will bring programmes of high quality into schools; teachers will not have to order them in advance, show them and return them as they do programmes of films. Again, teachers using television will not be faced as they so often are when showing films with the need to set up apparatus and to provide effective blackout. Against these advantages of using television, head teachers will certainly set the difficulty of fitting broadcasts into time-tables. Teachers may also find it convenient to gear syllabuses to television series rather than to devise their

own. On balance, however, many teachers will find television more convenient to use than other varieties of audio-visual aids, and local authorities which are able to face the high cost of equipping schools with television sets will most likely find that a "principle of displacement" (18) will begin to operate; sound film and radio, functionally similar to television, will probably be less used, though the use of filmstrips, tape recorders, and gramophones will presumably be much less affected.

In Britain the experimental period of school television broadcasting is over. Television is now established as a feature of the educational scene. Though it is still too soon to speak of established practice in the use schools make of television programmes, teachers have already discovered that they must prepare for them and must follow them up much as they must do when they use other audio-visual aids. Arrangements for ensuring *rapprochement* between programme planners and classroom audiences resemble those made in the comparable field of sound broadcasting. Description of the organization in the sphere of educational television is, however, complicated by the fact that the Independent Television Authority also provides programmes for schools, and these may or may not be built on the same lines as those provided by the B.B.C. for the School Broadcasting Council.

Any adequate curriculum must in part be designed to interpret the world to boys and girls growing up in it. Now, much of the 'literature' of the modern world is provided by mass media and notably by film, television, and radio. Yet schools have been slow to offer courses intended to help children to approach this 'literature' of their world of to-day and to-morrow with more critical discrimination. That cultural gulf which so often yawns between teacher and taught is nowhere wider than at this point: school offers a classical written literature; home concentrates on a popular audio-visual one. Failure on the part of teachers to bridge this gulf may be ascribed to indifference, to lack of training, or to over-insistence on transmission of heritage as part of the work of schools. Happily, some teachers have scaled these obstacles and have succeeded in crossing the gulf separating them from their pupils. With the support of organizations like the British Film Institute and the Society of Film Teachers, they have introduced film, and more recently, television appreciation as a curricular or extra-curricular interest. In this context, social relevance is clearly for them a criterion of curriculum construction.

Teacher Preparation

Teachers of film and television appreciation must themselves be film-going or television-viewing enthusiasts capable of communicating

something of the increase of pleasure which more critical looking will afford. They agree that their teaching must not concentrate on techniques of production; they aim rather to discuss themes, stories, characters, and ultimately, the intentions and sincerity of producers and directors. Their experience confirms that the most successful approach to appreciation is discussion centring on the film-going or television-viewing of the children themselves. Where appreciation is part of the curriculum, teachers usually ask for some written work connected with it. This sometimes takes the form of preparing film scripts of original or familiar stories, an approach which has, apparently, been most successful. In many cases, children who have prepared such scripts have then proceeded to make short films based upon them. Showing and discussing specially edited excerpts from feature films of high quality clearly has a part to play in teaching appreciation. Teachers may also profitably spend lesson or cinema club time by showing suitable complete feature films, like those, for example, produced by that internationally famous British organization, the Children's Film Foundation.

Teachers of film and television appreciation try tactfully to guide children towards liking what is good partly to guard them against ready acceptance of what is bad. They recognize that children of all ages, and perhaps adolescents in particular, are being continually exposed in their viewing to suggestions that "the highest values in life are riches, power, luxury, and public adulation, and that it does not matter very much how those are attained or used". All the more need, then, for schools as communities to help children acquire sound attitudes and ideals. More specifically, however, children should have some special training to strengthen them against "the repetition and glorification of false patterns of life" implicit in so many film and television programmes. This consideration led the Wheare Committee, which reported on *Children and the Cinema* in 1950, to insist that film appreciation, for older children at least, should form "part of the general educational process". If this was to be done effectively, the Committee continued, then special attention had necessarily to be given "to providing better facilities for training . . . teachers and youth leaders . . . in film appreciation" (19). Unhappily, few British training colleges have so far attempted to implement that recommendation.

The need for teaching appreciation of sound broadcasting as a counter to bad or indifferent programmes has been altogether less urgent than the need for teaching film appreciation on the same score. The School Broadcasting Council has always aimed to provide "examples of radio as an art form in its own right and to give a training in selective and critical listening" (20). Many of its programmes

for schools have indeed been what a recent Ministry of Education pamphlet called them—"little masterpieces" of their kind (21). In programmes for adult audiences, the B.B.C. has also shown great social and artistic responsibility. In Britain, sound broadcasting has been considered an educational as well as a recreational medium, and B.B.C. programmes have undoubtedly stimulated public interest in music, drama, and informed discussion. So far from lowering standards of taste, they have done much to raise them throughout the community. Nonetheless, many teachers consider that if children are to derive the greatest benefit and enjoyment from listening to sound broadcasts they should receive training in appreciation while they are still at school.

Teachers find that using the new media makes additional demands on their time and energy. They must search for titles in catalogues or periodicals, and try to keep up to date with reviews of films, filmstrips, wall charts, exhibits, or records. They must order in advance what they require, preview it, present it and in due course return it. They must mutually adjust their syllabuses and programmes of radio or television series. In their spare time, they must attend lecture-demonstration courses or conferences on educational uses of the new media. Yet they willingly accept these additional jobs, largely because they know how much the new media can do to open the eyes and ears of children to worlds which otherwise they would never explore. Again, teachers know that experiences children get via the new media can be so rewarding and so 'explosive' as to make them turn urgently to words and paint and modelling materials with which to express what they feel. This breath of vitality which new media can and often do import into classrooms is to most British teachers repayment enough for the extra work which their use entails.

R. D. BRAMWELL.

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The Impact of Radio and Television on Education in U.S.A.

THE increasing adoption of television as an educational instrument in the United States promises one of the most drastic revolutions in education since the changes caused in the concept of 'schooling' by print. Not that most of the elements were not earlier present: school population growth; teacher, space and fund shortages; curricular proliferation, audio and visual aids, and all the rest. But television has brought them into a focus and precipitated a scrutiny, possibly long overdue, which few had anticipated.

The monthly Research Factsheets which the National Association of Educational Broadcasters (N.A.E.B.) has published for several years have become monotonous in their droning sameness: "No significant difference" in the amount of learning measurable when television is used, as compared to 'face-to-face' instruction, in nearly all subjects and grade levels, and so on. Reports of this sort are essentially valueless. There *must* be differences. But the measuring techniques and tools available, designed only to measure lineal and print-based effects or effects which can be communicated in writing, are inadequate to measure the kinds of learning and conditioning which are now occurring. The realization of the real inadequacy of educational testing and measurement procedures and instruments to-day is leading to serious concern which is, in turn, leading us to a basic examination of *all* media and their inter-relationships, respective biases and strengths, and interplay. This, in turn, is causing audio-visual and film specialists, radio and TV personnel, curriculum specialists, book publishers, teachers, and administrators to pool their concerns and findings in a common effort not forced until the advent of television.

Many joint conferences are at present being planned with all sorts of specialist groups with which educational broadcasters earlier had only nodding acquaintance. A new and encouraging consolidation of efforts of all kinds has been forced by television's emergence into the educational arena.

Modern media, as they are coming to be used by education, will inevitably not merely cause changes; they will bring about a revolution, already begun, in the educational system as we know it. Prior to the use of print, education was a wholly differently organized process from that which we know to-day. In freeing education from the rigid

patterns imposed by print, the new media coming into use promise far more fundamental changes than most educators even to-day foresee. Studies to help us understand and control these changes are far more urgently needed than are studies in superficial 'uses'.

Fundamental Changes due to Mass Media

Print-based learning is, as compared with that of modern media, a slow, incomplete process. Print is lineal. We read word by word. Ideas and impressions come gradually, at a relatively slow rate, largely through the eyes alone. One plane at a time is involved, and ideas emerge at a controlled rate from a concatenated succession of frozen images which are largely, after the first year, encountered in solitary reading. The reader has time to stop, analyse, or re-read. Even so, we have recognized the need for courses in literary appreciation and analysis as a basis for uses of the written and printed word. The dangers of unskilled or unethical uses of print-based media have been recognized, and nearly every teacher is asked to serve partly as an English (i.e. print-based language) teacher. Good courses in this area recognize the interaction between the passage read and the reader. Essentially these courses assume print-based patterns of thought and behaviour as well as communication. To-day our whole idea of education ('well-read') is essentially in terms of print.

Each medium not only provides transportation but also patterns for thoughts, as rigid in their deepest respects as railroad rails. These patterns are imposed not only on education: in the lineally devised textbooks, curricula, and classrooms set up in rows—following the introduction of print—with student-by-student recitation, but also on industry with its production lines. They tax the ability of teachers and everyone who is the product of a print-based education and culture system to cope with non-lineal impressions and messages.

In classrooms to-day, most teachers called upon to guide and control uses of radio and television, do so as if these were merely extensions of print and lineal methods and approaches based on print or merely additions to the tools available. Through no fault of their own, they are largely unaware of the fundamental characteristics of the media themselves as media.

Yet profound and worried scholars have found that in the case of television, for instance, the medium itself, without regard to content, accounts for by far the largest part of its total effect. Scholars who have studied monopoly-B.B.C. uses, uses in the U.S.S.R., uses by commercial broadcasters of the United States, and uses for education, find that many of television's (and radio's) most profound effects are common to all systems and uses, regardless and independent of message.

content, method, use, or *intended* effect. The most profound characteristics of media, as media, have not been recognized by educators generally at the fundamental level at which we must start to study them if utilization of, and education in, these media, for teachers and students alike, are not to be merely gadget-oriented. All too many of our current television education success stories, in nearly every subject and at nearly every grade level, will in later years appear almost criminal in their misconceptions and misuses of the medium.

Unless we recognize the deeper powers and implications of all media, and the role (which we must ourselves delimit) of new media, our old print-based educational system may be swept away, carrying with it many elements which desperately need to be preserved. The new media herald a break-through from print-based culture which, if not understood and controlled, can sweep away the classroom itself. Print did equally drastic violence to older educational systems and traditions. Television and radio already reveal the power to do this same violence to our present print-based system of education. The new media will not indefinitely do only the old jobs in education—but also many jobs which could not have been attempted, or even conceived of, without the new media. Latent needs and lacunae in our present curricula are being revealed which we did not even imagine possible until the tools with which to meet and fill them were at hand.

In classrooms to-day, teachers trained largely on and in print-based procedures, themselves conditioned by and having their entire professional investment in a lineal, print-based culture, confront children who have learned most of what they know from, and have been subliminally conditioned in a way they are not aware of, by electronic, non-lineal media. The role of the teacher and that of print media are undergoing drastic changes that have not yet been adequately identified. These are not unrelated to children's respect for their teachers, and for what the teacher still thinks of as education.

The principal characteristics of radio and of television particularly are non-lineal, all-engulfing, simultaneous. They involve the whole person: kinesthetically, subliminally, emotionally, through all the senses except the sense of smell, in an overwhelming impact that lineally educated teachers, with step-by-step thought processes, find difficulty in adjusting to, understanding, controlling or guiding. The misunderstandings which arise are natural. For the new media are, in effect, *new* languages, no longer lineal but nuclear or spherical in their characteristics and effects just as certain non-Western languages, particularly in pre-literate cultures, are non-lineal. They cannot even be adequately analysed on a lineal basis or in terms of lineal logic. Their effectiveness cannot be tested by lineal, print-based tests, which limit

the amount of effect and impact measurable to a tiny proportion of the total effect felt or achieved.

With the classroom walls dissolved, and children in the United States, at least, acquiring many times as much both in attitudes and information from these nuclear media as from the school or teacher, the latter feels confused, frustrated, unable to cope fully. A new role must be defined for him. How would you feel if a student told you that he understood more of a physics unit from a single telecast than from three weeks of intensive study with you in the best organized sequence you were able to devise?

The Need for Teacher Education in a New Situation

Through the years, many serious scholars and critics have called for courses in radio and television appreciation. With the new role which the new media will play, and are now playing willy-nilly in American education, such courses are to-day far more urgent than we earlier suspected. For if the uses of these media are frozen into patterns based on ignorance, superficial observation, and the limitations growing out of print-based traditions (as they so largely are to date) rather than on a real understanding of basic media meanings, implications, and potentials, a disservice rather than a service will have been bequeathed to posterity by the pattern we are now establishing.

The courses needed cannot be merely in the new media, for the 'frames of reference' which separate one medium from another are being altered day by day in the amorphous interaction of one upon the other. Television, for example, has already changed the roles of radio, the book, film, photography, magazines, and journalism, and is itself being changed by the eddies and counter-pressures generated by this daily media interaction.

With media as such now assuming such powerful roles in education, society and human adjustment, 'grammars of the media', which will enable teachers and our educational system to cope with them and control them, are most urgently needed. The N.A.E.B., in co-operation with the U.S. Office of Education, and with Dr. Herbert Marshall McLuhan of the University of Toronto as consultant, is now seeking to develop such 'grammars'. They would be used first in teacher training and later in media courses for all students in American schools at whatever grades seem (from such experiments as we are able to carry out) to be indicated.

Education must embark on a new venture: universal education in the languages and values of media themselves, so that each of the new and old media may find its proper role, and so the best contributions of each may be preserved and realized together with all the others.

This statement is made because there is danger that the present accumulation of fragmented projects or findings based essentially on media as tools may, if these deeper considerations continue to be ignored, contribute to the dissolution of some of the finest values in our present great educational system, whilst at the same time contributing new uses and values.

Various efforts have been made in recent years, of course, to reveal and codify the unique powers and patterns of the various media of human expression. Cardinal Demant, in articles several years ago on "The Unintended Effects of the Wireless", and later of television, saw several of these problems. That print, photography, movies, radio, and television have their own biases of statement and presentation was recognized by H. A. Innis in his book, *The Bias of Communication* (1951). Wyndham Lewis, in *The Art of Being Ruled* (1926), and in *Time and Western Man* (1927), had earlier adopted the approach of artistic structural analysis to science and also to commercial entertainment. Professor McLuhan, in *The Mechanical Bride*, carried the Lewis and Innis methods of analysis into the world of advertising and into the study of the comics, the Press, magazines, the popular book, and their relation to the higher arts of our time. In numerous shorter studies, E. C. Carpenter and Marshall McLuhan have analysed the technological media as new 'languages', each with its own grammar and syntax.

Perhaps it is a good thing that commercial television in the United States has frightened us a bit with its social and subliminal effects, and has raised questions about its relation to juvenile delinquency, mental illness and other attitude and behaviour patterns. For by so doing it has even brought about a new appreciation of the possibilities of that old medium, radio, and a new look at that medium's effects and potentials.

It was found in the Philadelphia Public Schools, for example, after some courses in both media, that successful music appreciation programmes requiring complete concentration on the message are far more successful when presented by radio than by television. When these programmes are televised the children are distracted by visual and mechanical details, such as camera movements, irrelevant focus, and the like. Likewise, in music programmes concerned with rhythm and tempo, more creative expression has been found to result from radio rather than television transmission.

This same finding has been reported from Professor James Schwalbach of the University of Wisconsin, who has broadcast art programmes over the Wisconsin School of the Air by radio for some twenty years. After a brief effort to stimulate creative imagination by

television in comparable broadcasts, Professor Schwalbach has gone back to radio because, for his purpose, it is far superior to television—not merely vastly more economical. For he found that imagination is immediately limited and stereotyped by efforts to make art principles concrete and visual. The stereotyping and imitation which resulted from his television efforts were disillusioning.

The extent to which radio listening can also be engaged in simultaneously with other activities, the value of radio for emergency use and in those cases where straight facts or principles need to be transmitted, should cause educators to think twice before deciding to scrap radio, skip it completely in their plans, or put all their faith in television. Cost is, as suggested above, another factor in favour of radio compared with television. Education needs quantity and variety in broadcasting to serve its many purposes.

The following quotation from a study by Dr. Kenneth Harwood of the University of Southern California, which will be published jointly by the N.A.E.B. and another group within the next few months, is relevant:

During the past thirty years controlled studies of radio indicated that radio may be used with success in the education of school children, college students, and adults in learning psychology, religion, law, languages (cf. Linguaphone and Berlitz recordings), literature, reading, writing, speaking, the natural sciences, arithmetic, agriculture, home-making, art appreciation, music appreciation, and the social sciences. General finding: no significant difference between the number of facts learned with radio teaching and the number learned with face-to-face teaching. Special findings: radio shares special advantages with sound-recordings, and probably with television, in the teaching of foreign languages; radio shares special advantages with sound-recording in the teaching of music appreciation. 'Special advantages' means that radio can produce more learning than face-to-face teaching consistently to a statistically significant degree.

FM educational radio in the United States is heard by adults who are highly literate and influential opinion leaders of a community, as indicated in studies by Professor Kenneth Kager of KUOW, the University of Washington's educational FM station.

Radio has lost the attention of many resourceful and imaginative researchers in the shift of interest to television during the past decade.

Much radio research remains to be done. Costs of radio per unit of educational effect may be very favourable but are largely unknown. Applications of decision theory, operations research, etc., to the improvement of educational radio stations have yet to be evaluated. The development of inexpensive FM portable and automobile receivers would bring educational radio to many people. Informative effects of multiplexing sound broadcasts with supporting facsimile presentations remain to be studied. What are the special informative values, if any, in stereophonic broadcasting? Fairbanks *et al.* (at the University of Illinois) have found that speech may be speeded up to 300 or more words per minute without significant loss of comprehension. May radio broadcasts of speeded speech save time in learning? To what extent may

'subliminal' aural stimuli supplement normal informative messages? What are the humane effects of informative sound-broadcasting? These are some of the research questions to which we need answers.

In the United States the concept of radio and television as potentially great educational instruments has been rendered vastly more difficult to accept than in most nations by the atmosphere and tradition created by its sales-dominated history. Hundreds of letters are received by educators and stations from indignant listeners who protest at the introduction of educational programmes or services. "I look at television to relax," they say. They see radio and television as primarily if not solely entertainment media. That is their function, even their duty, in the minds of many. The commentary which this constitutes on American commercial radio and television's concept of their function in a democracy needs no further commentary here. But it is a tradition and an obstacle which educational users of these media must almost daily combat.

An Experiment in Broadcasting for the Individual

One of the most successful efforts to combat it has been made by a small, courageously operated FM station on the west coast of the United States, in Berkeley, California. Founded by Lewis Hill, now deceased, this station was begun essentially as an experiment. The experiment, as Mr. Hill described it, was to test whether as many as 2 per cent of the population of a metropolitan community were dissatisfied enough with usual mass-audience, commercial radio (and by extension, TV) programming to be counted on to pay \$10¹ per year for a separate service, free from commercials and pitched at an adult rather than an adolescent or homogenized level—much as they might pay for a limited-edition magazine to meet their needs.

Some conclusions emerge from this experiment, now an unqualified success.

- (1) Radio and television are not necessarily *mass* media.
- (2) Enough people want the finest things that the best minds can communicate to justify stations intended to broadcast to the intelligentsia and the cultural élite.
- (3) In a century of mass tastes and universal homogenization, people with *minority* tastes in the United States have to expect to pay separately for the satisfaction of their spiritual and intellectual needs; they recognize this and are willing to pay extra for the satisfaction of such needs.

This station frankly admits that it does not attempt to please

¹ £1 = 2.80 dollars.

majority audiences. Its programmes are not designed for continuous listening. It does not expect any person or persons to enjoy them all. The moving of 'intelligence', of programme material rather than beer, soap, cars, and so on, is the primary objective. An opportunity for listeners to vote directly for the programme as a product rather than only for the programme via the sale of the product advertised, is unique in the United States and provides some revealing results. General commercial programme practices in the United States have always seemed mysteriously unscientific and inaccurate to many of us. It is here proved to be all this and more.

Several passages from this report reveal the adult and original approach here reported: "The audience was believed to consist of an individual, whose intention was to listen. He was assumed to have an alertness, an intelligence, an interest and an attention-span commensurate with those of the persons preparing and airing the program—it was a hopeful assumption that the radio would be turned off, or to another frequency, when KPFA's particular program had less than a compelling value for the [expected] audience of one."

The entire atmosphere at this station is informal and deliberate to illustrate that "the act of broadcasting was taking place in modest rooms, with people present". Dead air was and is frequent. Timing is casual: "... the station from the beginning eliminated close timing of individual programs ... the end time of a program can be determined by the fulfillment of its own purpose and content. ... This practice [of close-timing] had an entirely economic origin and meaning ... there appeared no reason whatever for its continuance in educational radio not engaged in the sale of time segments. No musical 'themes' are used—programs are put on the air with a simple announcement of their content and purpose. No attempt is made 'to keep the microphone busy when silence is a simpler alternative'." Intermission silences are common.

But it is perhaps on the subject of audience definition and ratings that this station's concept views are most original. Mr. Hill takes to task the old theatrical analogy whereby "the broadcaster is forever trying to peek through the curtain to size up the house". The integrity of the medium and its operators, Mr. Hill felt, would come through to intelligent listeners, which was the only kind he was interested in. "When the address in the studio is to that part of the broadcaster's identity which he most respects, most of us will be honored to share it. ... It was felt to be imperative that control and execution [of programs] be in the hands of a reasonably homogeneous group, free to search its excellences rather than its averages."

There was no simulated interest on the part of the staff. Such phofi-

ness shows disrespect and contempt for the intelligent individual. The broadcaster is interested in his material: "The broadcaster does in fact participate in his own act—the thing broadcast arises in, or answers in immediate ways, the [intelligent] broadcaster's own sense of value."

The loyal support of this venture in the Berkeley area is a heart-warming demonstration of the hunger of intelligent people for intelligent, minority uses of radio and television. The assistance provided by the Fund for Adult Education is one unique answer to the question: What is the role of philanthropic foundations in American Society? In this case a foundation made possible an otherwise impossible experiment which should provide a model for a whole new breed of broadcasting stations, both radio and television. It made possible the testing and the disproving of many clichés ("under the American system, you can't——") repeated *ad infinitum* in the trade, and the report from which I have quoted.

British readers will undoubtedly be pleased to observe the success accompanying the introduction of several essentially British beliefs and practices. The climate in the United States, too, is changing.

The Necessity for New Thinking

To solve our educational problems we need to think in new dimensions. The answer to our need for better transportation a hundred years ago was not merely more horses, more drivers, and more buildings to keep them in. It was a *variety* of means of transportation, public and private. Just as not all messages deserve to be sent by telegraph or telephone—there is room both for air mail and ordinary mail among others—so not all materials deserve television treatment. Radio, the film, books, and face-to-face talks with the teacher are equally essential, but for different purposes and problems.

Some of the instruction now carried on in classrooms and by correspondence will need to be continued in its present form. Some can as well or better be done at television sets in homes, or extension centres far from the central buildings of the school or college. Reports from the Extension Division at the University of Iowa several years ago revealed that instruction to farmers in tree-grafting and various other techniques could be vastly more efficiently and economically done by television than by extension workers by car. Programmes on insect and rodent control were adequately transmitted by radio with even greater savings. The uses of television in surgical demonstrations are nothing less than amazing. In demonstrations which the author produced for the Medical Center of Indiana University over ten years ago, literally hundreds of (admittedly already trained) doctors were shown

every moment of a distinguished surgeon performing 'blue-baby' and other surgery which few had previously been able to see. The lives saved by this single week of training telecasts for doctors in service reveal one of television's unique values. Even the distinguished surgeon himself looked at his monitor, because he declared that he could thus see better in certain parts of the opening.

It is incumbent upon all educators to associate themselves with these new tools, to vow to adopt a new open-mindedness on the basis of which *all* instructional tools and techniques will be approached with respect and will be developed more adequately but in more specialized fashion. We need more research so that we may know when television is the best tool, when slides or sound film on individual classroom or auditorium-wide bases are the best tools, and when radio is the best tool; but *also* when a teacher with no more than five or six people, with no distracting tools, is the best way. Such research must be *honest*. Once done it must be recognized, and we must adapt ourselves to it if we are to serve the needs of our age rather than only the jealous cause of our own 'empires' as individuals or groups.

A pattern dictated by tradition and anachronistic space designs, in which one lecturer gives the same lecture several days a week in the same course, is inefficient. A pattern which cuts students off from contact with great teachers (simply because they are on television, radio, or film) and condemns them to contact only with sometimes mediocre teachers is not fair to students. Expecting well-educated good teachers to spend a large proportion of their time and energy in non-teaching detail, routine and menial activities is inefficient. Taxing the citizen to build more of the same kinds of buildings which, with our suburban development in a few years stand half-empty, is inefficient.

In a formerly prosperous section of Chicago stands the Second Presbyterian Church. Its Tiffany stained-glass windows were the pride of its huge congregation a generation or two ago. To-day, caught in the population shift following transportation changes, it stands in a slum area, increasingly deserted, unable to raise a small fraction of its former budget.

In Boston large numbers of school buildings stand half-empty, while high-population suburban areas farther out cry for more space. In an age of population mobility in the United States, telecasts and radio broadcasts of basic subjects give children a thread of continuity as they move from state to state or city to city, even though teachers and textbooks change with each move.

We must honestly analyse the meanings of our new age and all the changes it is bringing. Certainly one lesson emerges: buildings and

other heavy capital investment, which depend for their value or power on *location*, at least in the United States in its current mobile stage, run the risk of all too soon becoming burdens instead of advantages. I believe we must challenge many such traditional concepts, not in a revolutionary way but as solid citizens and educators, regardless of what it requires from us in self-examination and adaptability. Otherwise, our inertia will hold up progress which must come if education is to meet to-day's needs.

I see the day when there will be a sober recognition of the fact that neither the individual, nor books, nor buildings, can do more than a portion of the job to be done . . . an age when 'media specialists' will be part of the educational administrative planning team as they are now key members of advertising agency staffs, helping to decide how best to accomplish the total job which needs doing regardless of the tools used. When this is true our schools can claim with truth that they are no longer in the dark ages in methodology, as they unfortunately too often now are.

Radio and television will enable education to meet the new needs and the new challenges of our age, and to meet some of the problems of the unbelievably increased mobility of population and increased costs of space. Radio and television will help the teaching profession to achieve that level of excellence, remuneration, respect, professionalism, and recognition which it deserves—but which can be won only by courageous uses of these media, which claim so much of man's time, and by increased quality and educational productivity.

In current uses of television and radio as well as of other educational instruments we have too often picked up the wrong end of the stick. At a recent conference a television producer wanted to know how to reconcile teachers and academic departments to television and the new roles it assigned them. "The teacher wants to talk the entire hour; and he's not very good," he remarked. I suggested that perhaps he could explain that the objective of the telecasts was not teaching but *learning*. It is what the student learns which measures our success for any given programme or study. Seen in this way, the teacher will play greatly variable roles in different subjects and telecasts or radio broadcasts. A part may be visual—or documentary material. The teacher plays only a part in the learning process. When small objects are to be shown or demonstrated (for which purposes television is uniquely useful), the most complete obliteration possible of the teacher serves the purpose of greater concentration and learning. But this new role for teachers also needs to be learned by them—not merely taught or told to them.

In the United States the only members of a radio or television

station's staff who must meet prescribed qualifications are the engineers. They must have a licence from the Federal Communications Commission. The delivery boys—those who make sure the message gets through—are licensed. Those who put up the prescriptions (with possible narcotic and other effects) need meet no prescribed educational, moral, or other standards.

We believe the power, both intended and unintended, of these electronic instruments is so great that the day will come when their operation can be entrusted only to carefully trained professionals. Until that day comes, much remains to be done to ensure that our teachers and our children begin to understand them—lest they control and condition us with their electronic fall-out in as significant a way as atomic fall-out may be affecting us and our progeny. It is for this reason that we are concentrating, as the association of educational broadcast professionals in the United States, on the development of professional standards for all who prepare materials for these media or broadcast over them. It is our hope that these standards may eventually find their way into United States commercial station and network staffs as well. In this effort we welcome and solicit the co-operation of men of good will in all lands.

H. J. SKORNIA.

Political Propaganda and Commercialism in Mass Communication in Japan

In a remarkably expanded and specialized modern society, consisting of extremely complicated heterogeneous components, with many differences and divergent views, it is mass communication that joins together people who would otherwise be isolated from each other and dispersed over a large area. By enabling large numbers of people who are not acquainted with each other to read the same newspaper or watch the same TV programme, mass communication is supposed to give a general background of understanding and encourage social co-operation through extending the area of mutual agreement.

If we may consider that the masses who are connected with each other by means of mass communication are a group of people being forced to share general problems, becoming divided into groups in dealing with these general problems, yet still taking part in discussions to solve them, it could be said that the existence of a reasoning 'public', a *sine qua non* of democracy, is finally secured only by mass communication.

In the formation of democratic opinions mass communication is essentially considered as discharging its functions by presenting problems to the masses, furnishing them with the opinions of specialists, and offering a medium for popular discussion. Therefore, if its functions were to be perverted, democracy in modern mass-society would be in danger.

Political Character and Authoritarian and Liberal Attitudes

There have been two important opposing attitudes in Japan regarding the serious functions of mass communication: namely, the authoritarian and the liberal. Problems arose mainly in connexion with the political powers of the former, and in relation to the commercialism of the latter. Newspapers provide a good example.

The main trend in modern Japanese newspapers after they were started in the 1870's was the publication of political papers that reflected upon political thought. The newspaper in Japan was born and shared its fortunes with the liberal-democratic movement. It also protected the masses as a 'tribune' against political authority, and developed within the tradition of a liberal-democratic attitude towards

its functions as a social agency protecting freedom of thought and speech. Therefore, the newspaper frequently fought against the authoritarian attitude of the political powers and consequently was oppressed. During the period between 1876 and 1880, 200 reporters of newspapers and magazines were imprisoned or fined. Through their Constitution Protection Movement, the newspapers took a lead in the national movement which resulted in the overthrow of the Katsura Cabinet only three months after its formation in 1917. On the occasion of the *coup d'état* attempted by a group of army officers on 15 May, 1932, the Fukuoka *Nichinichi Shinbun* continued to write its editorials in opposition to the army, despite the fact that army bombers were circling over the roof of the building.

However, after 1930, with the development of fascism and an intensification of internationalism, the newspaper and mass communication, which had already become profit-making and had accumulated large capital, had to be altered from a liberal attitude to one of co-operation with national policy. Thus, mass communication was at last in tune with the authoritarianism of the political power. In the process of changing its character from a political paper to a commercial one, the newspaper came to be not so much a 'tribune', whose duty was to protect the freedom of speech of the masses, but a 'herald' inclined to transmit the intentions of authority. In the days of the occupation period after World War II, it cannot be denied that the above tendency, through the purge, and the enactment of the Press Code by the Occupation Forces, was greatly increased.

When the occupation of Japan ended, liberal-democratic theory greatly influenced mass communication. However, a trend towards *laissez-faire* was accentuated by the struggles among various, ideologically different, social powers, which have been seeking to influence mass communication. Consequently, international and domestic political influences, particularly of those which use mass communication as a medium of political propaganda and for the purpose of organizing the masses behind new social movements, seem to be again creating a change of attitude in favour of authoritarianism and bureaucratic control on the part of the political party in power. Therefore, the newspaper in Japan is now maintaining an attitude of so-called neutralism, restraining itself from criticizing either side.

Since the development of radio and TV as means of mass communication has made the control of radio channels inevitable, their distribution and the supervision of their use by the Government is coming to be reasonably justified. It may be said that one of the *raisons d'être* of the government is to make mass communication fulfil its original

functions by properly ensuring freedom of thought, speech, and publication.

Commercialism and Social Responsibility

Mass communication has seized the masses by associating itself with commercialism. Taking a present leading newspaper in Japan as an example, we find that its circulation in 1910 was only 200,000. However, in 1918 the paper established its new policy of regarding a newspaper as a *commodity* and changed from a political paper to a commercial one, thus increasing its circulation to 2,500,000 in 1930. To-day the circulation of that paper is said to be approximately 7,500,000. At the same time, this newspaper company publishes a weekly paper, the circulation of which is 1,500,000; it produces a movie news-reel that is put on the screen in the cinemas all over Japan every week, and also operates a broadcasting company on a large scale. Now mass communication is operated by capitalistic commercialism under the control of a huge monopoly.

Commercialism has popularized the contents of mass communication and, at the same time, has greatly lowered the production cost by getting income from advertisements; thus we cannot ignore the effect of commercialism. It is a fact that commercialism has fulfilled the fundamental requisite for the development of mass communication by capturing the attention of the masses. We cannot ignore the fact that mass communication might reach the stage where it is influenced by vested interests and consequently might be driven to extreme sensationalism. It might then no longer report facts which should be reported and might fail to comment on events which should be commented upon, thus it might lose its original functions, so as finally to become simply a consumer article of degenerate quality. When commercialism becomes excessive, it is apt to make mass communication an appeal to psychological violence with an anti-social character. Thus the need for a responsible social theory is clearly established, and a social system other than totalitarianism should be devised to ensure social responsibility.

With the recent rapid popularization of TV, discussions about the influence of TV on boys and girls have become active in Japan. A judge who presided at a case of murder by a boy, committed in Tokyo in 1959, said that "It could be considered that the murder had been committed under the influences of the movies and TV." To support the statement of the judge, it was reported that as many as seventy-two persons had been killed on the screen of three TV stations in Tokyo in only two days (a Saturday and a Sunday) at the time the murder had taken place. However, the results of substantial researches on TV-

influences are not so pessimistic. According to an *Investigation into the Influence of TV* published by the Ministry of Education in March 1959, 2,500 juveniles were surveyed, and it was found that 65 per cent of elementary schoolchildren watched TV for two to four hours on every weekday and 85 per cent of upper secondary school students for one to three hours on every weekday. The frequency of watching TV decreases gradually during the period between three and six months after TV is installed, and children naturally begin to be more deliberate in the choice of their favourite programmes. Therefore, if the grown-ups in the family guide them carefully, it should become possible for the children not only to evaluate the programmes, but to plan how to spend their time at home, including hours for study and sleep. While watching TV, the reading ability of children is temporarily lowered, but it is pointed out that later a tendency to desire 'famous stories' becomes very marked. Therefore, it could be said that the extent to which grown-ups take account of the educational influence of TV on children will have great bearing on the effect of TV, because it is personal communication that finally decides the influence of mass communication. Here can be discovered the first educational medium.

In June 1957, the Ministry of Postal Services decided to establish 108 TV stations all over the country, including fifty-eight private stations in compliance with the regulations of the Radio Law. This was done on the condition that, in the case of education TV stations, educational and cultural programmes should be telecast every week over 50 per cent and 30 per cent respectively of all the programmes; for semi-educational TV stations, over 20 per cent and 30 per cent respectively of all the programmes; and for ordinary TV stations, educational and cultural features should take 30 per cent of all the programmes.

The above decision could be called a remarkably good example (and worthy of attention) of how an attitude of social responsibility may be secured for mass communication by the control of programming through the assignment of wave channels.

MASUNORI HIRATSUKA
BUNKICHI IWAHASHI.

DEVELOPMENTS: INVENTIONS AND RESEARCH

In this section the two themes previously outlined are again taken up and illustrated through case studies. The first of these themes concerns the wider dissemination or democratization of information; the second deals with the effectiveness or quality of communication.

Developments in methods of collecting and disseminating information are discussed in the first three articles. Miss Winstanley points out how traditional museums have been used much more extensively since the Second World War as agencies for the dissemination of knowledge. Many museums in the world now have a mass audience and through their activities contribute to the solution of problems such as illiteracy. On the other hand, the formal educational role of museums has been increasingly recognized especially in Europe. For schools to use museums effectively, demands purposeful, carefully prepared visits with follow-ups in the classroom. Many museums now have special services for visiting schools designed to promote these ends.

A logical extension of this attempt to preserve information of historical interest is found in the museum which collects and catalogues sound recordings and makes them available to research workers. The history of the development and the principles of operating such museums are discussed by Mr. Saul. A great deal of knowledge is now stored in the recorded speeches of great men; much new information has been gained from recording techniques like those used by the anthropologists who wanted to study the rhythms of different languages. The desirability of preserving sound recordings in an organized fashion is obvious. Should there be specialist libraries or comprehensive collections? Should archivists be selective? How can they ensure that copies of all recordings are made available to them and adequately documented? These, among others, are the questions to which Mr. Saul turns his attention.

Present conditions have created problems for libraries too. Mr. Foskett's thesis is that the present amount of research work and the increased number of publications force librarians to re-examine their role and methods of serving their public. He suggests that with the rise of industrial science a new concept of scholarship has arisen. There are more specialists than previously in any one field and they tend to work

in more centres. The librarian's task is to bring to researchers as quickly and as completely as possible all the relevant information a worker might desire about a certain topic. A variety of new forms of documentation, techniques of service, and indeed of new types of library have been devised, in part to meet this need. Mr. Foskett describes many of the new developments throughout the world and evaluates them from his own standpoint.

The next four chapters are of specific inventions or experiments in the field of new media. Mr. Johnston outlines the various uses to which the tape recorder can be put, pointing to its value when children themselves prepare and edit tapes. One important result is an increased interest in good speech both by teachers and children. The advantages of recording lessons given by students in training are that the lesson can be played back for discussion and criticism, and that it eliminates the complicating factor in the classroom of the visiting tutor. The possibilities of producing documentary tapes about life at home and abroad serve to extend the vicarious or mediate experiences of children. Dr. Lee's account of the synchroreader suggests that this experimental piece of equipment combines most of the qualities of the tape recorder with some new features. Auditory and visual images are synchronized; the recordings are cheaper to make and easier to send through the post. They may be filed as papers. The maintenance of a spoken correspondence between individuals at other ends of the earth arises as a possibility in the foreseeable future.

At the moment, however, a great deal of attention is being paid to television as a method of providing lessons prepared and delivered by first-class teachers to much larger audiences. To attempt this kind of extension is particularly necessary when there is either a shortage of competent teachers or when pupils are widely dispersed geographically. Dr. Brish's account is of closed circuit television for science in the United States. The article by Dr. Perry and Professor Bereday gives details of the attempt being made in the United States to extend educational services and raise their quality by broadcasting from an aircraft simultaneously a number of T.V. programmes to schools over a wide area. In this experiment, as in others of its kind, the economic factors are important. Although the capital investment needed is often great, the relatively small contributions of vastly increased audiences make it economically viable—at least as far as the dissemination of information is concerned.

There are, however, major issues related to the effectiveness of communication and learning. Various channels of communication show different degrees of efficiency in terms of learning. Certain things might be communicated more effectively by radio than by television

—attitudes as well as information are important in this respect. In some instances the printed word, giving permanence to impressions and allowing for extended recapitulation and meditation, might be the most effective medium. Just how effective new media are is no longer a matter simply of speculation. A number of studies have been carried out which attempt to evaluate the differential teaching qualities of various new media of communication. Professor Foshay summarizes these for the United States and Dr. Himmelweit gives a résumé of the work being done in the United Kingdom. Sir Cyril Burt's article illustrates the importance of careful and detailed research in education in describing the work that has been done in the United Kingdom on the typography of children's books and its effect on learning, motivation, and reading facility.

This section does no more than present a few selected examples of the potential of new media and of the impact they are likely to have on school education. In summary it might be said that the articles reveal the need for adaptation in the use of traditional methods of collecting and disseminating information and for more research into the effectiveness of untried techniques. The latest device does not necessarily under all circumstances mean improved quality of communication.

THE EDITORS.

The Use and Development of Museum Services for Schools

THERE is to-day general acceptance of museums as instruments of education, but this has not always been so, nor as yet is the most being made of the many and varied facilities which they have to offer. The great museums of Europe originated in the private collections assembled during the Renaissance, but it was not until the nineteenth century, with the growing interest in popular education, that public museums as we now know them developed, although they were not then specifically designed for public enlightenment. In the early nineteenth century they were regarded as the resorts of students or eccentrics; children rarely visited them, except perhaps on occasional Sunday afternoons when Papa expounded the mysteries of nature to his dutifully attentive family. The nearest approach to the use of museums in formal education may well have been the occasional visits of the pupils of private academies or of young ladies or gentlemen in the care of governess or tutor. There are certainly no records of school visits until the end of the century, and museum education as such may be said to have started in Britain with the Great Exhibition of 1851, as a result of which the Victoria and Albert and the Science Museums were established.

A meeting of the Yorkshire Philosophical Society in 1888 recommended the preparation, by museums, of educational collections for loan to schools, while the Standing Commission set up by the Royal Society of Arts in 1873 had already urged that all public museums should serve an educational function. By the end of the century, a handful of far-sighted curators in Britain were tentatively using their collections for the education of the young. Displays of material of interest to children were arranged in the galleries, some museums were making loans of surplus material to local schools, and in 1895 a privately endowed Educational Museum was opened at Haslemere for providing instruction in natural history. All this was not without opposition, for the majority of curators were studious people who could not easily reconcile themselves to the idea of children invading their galleries, much less of any of the treasures under their care being lent to schools. One curator publicly proclaimed that he did not consider "it is our business in any way to teach people who come round".

Developments in Europe and U.S.A.

The development of the educational use of museums for young people on the continent of Europe has been slower than in Britain. This is probably due partly to the difference in educational systems and partly because the great collections of France, Germany, and Italy have long been regarded as cultural Meccas for sophisticated travellers. Nevertheless, school parties were certainly visiting the Louvre before the end of the nineteenth century and the Nordic Museum in Stockholm at the beginning of the twentieth. The Municipal Museum of Education in The Hague—an institution devoted entirely to the interests and requirements of school children—was opened in 1905. Otherwise, only isolated efforts to establish educational services in Europe are recorded.

The United States of America presents a very different picture, for there museums were established with a definite educational aim, often directed primarily at the child. The early part of the twentieth century saw a great increase in the number of museum educational services established: many, such as those at Brooklyn and Detroit, were devoted entirely to children's interests, while each year more education departments were opened and staffed with trained teacher-guides working in well-equipped premises. Some museums were inaugurated solely as school loan services, like that at St. Louis, which has no permanent public displays at all.

All this had its effect upon the subsequent slower developments in Europe. In Britain particularly, there were indications of an awakening of both museum and education authorities to their responsibilities in this direction in the years between the two world wars. The Carnegie United Kingdom Trustees published three reports, in the first of which, the *Miers Report on Museums of the British Isles*, published in 1928, twelve museums were listed as providing specific services of some kind for schools, while about 20 per cent of the total number of provincial museums were reported as being regularly visited by school parties. Nevertheless, the Report deplored the fact that so few local education authorities appeared to be interested in fostering the educational use of museums by the schools.

It is remarkable that in Britain the stimulus for the development of many of the services which exist to-day originated, not in the educational world but in the enthusiasm and good sense of members of the museum profession. A companion to the *Miers Report* also appeared in 1928, on *American Museum Work*, by Dr. Lowe, Director of Leicester City Museum, which established its circulation collection for schools in 1931. This year may be considered as something of a milestone in the history of school museum services in Britain, for it

was in 1931 that the Science Museum, administered by the Board of Education, opened its Children's Gallery, while the Board itself issued a memorandum on *Museums and the Schools*, aimed at encouraging and improving the educational use of museum collections. By this time, the Victoria and Albert Museum's circulation collection was no longer confined to art schools, but was also serving a large number of secondary schools, and several museums were embarking on school services of different kinds. The *Markham Report* on "The Museums and Art Galleries of the British Isles", published by the Carnegie Trustees in 1938, describes some increase not only in the number of museums actively encouraging school visits, but also in those providing special facilities with extensive school loan collections.

A few local education authorities now began to take an interest; in 1935, the London County Council introduced a scheme for greater use of the metropolitan museums which, it was suggested, could in some senses be regarded as extensions of the classroom and as reservoirs of teaching material. As a consequence, two museums administered by the L.C.C., the Horniman and the Geffrye, embarked upon educational services which, particularly in the case of the latter, have achieved far-reaching results. The Leicester circulation collection, with the practical support of the City Education Authority, had by this time developed into the most comprehensive service for schools in England, and the obvious value of this and other schemes stimulated the Carnegie United Kingdom Trustees in 1935 to offer three grants to county education authorities willing to experiment in the provision of loan services for schools in rural and isolated urban areas. The following year the first grant was made to Derbyshire Education Authority, which pioneered the administration of a school museum loan service independent of a public museum. Originally established for an experimental period of three years, the end of which coincided almost to the day with the outbreak of the Second World War, this venture might have been abandoned in common with others as a result of war conditions had it not been for the perseverance of the County Council in maintaining and developing it under considerable difficulties, and for the generosity of the Trustees in extending the period of the grant.

Inevitably, war conditions on the continent of Europe put a stop to all organized activities of this kind, and only in the United States of America, and to a much lesser degree in Britain, was museum co-operation with schools maintained throughout the dark years of 1939-45. Nevertheless, the war years provided an unexpected impetus to post-war developments, for it was during this period, particularly in the armed forces, that the full value of modern audio-visual methods of education came to be appreciated. The post-war years have seen a

great blossoming of the organized use of museums and museum techniques, not only in the Western world but penetrating much farther afield, fostered by the work of UNESCO in combating illiteracy and in seeking speedy methods of helping the under-developed areas of the world towards a more fruitful existence. The use in formal education of the film-strip, the ciné-film, radio and now television, have emphasized the importance of authentic three-dimensional objects. On the one hand, museums themselves now make use of audio-visual media, and on the other, museum methods are being used to a greater extent in the dissemination of knowledge. Efforts are being made to co-ordinate the use of available resources; school broadcasts in Britain, for example, have stimulated the arrangement of related displays in museum galleries, and in the United States the combined use of museums and television is being developed.

In 1948 the International Council of Museums was established under the auspices of UNESCO, and shortly afterwards an Education Section was formed with the aim of consolidating and expanding the museum education service throughout the world. In 1952 UNESCO organized a seminar to consider the role of museums in education, held at the Brooklyn Museum in New York, the home of a famous and progressive education department. Experts from twenty-four nations attended the seminar, which covered all the major activities of museums in the educational field, with special emphasis on the problems of fundamental education in the under-developed countries. Two more seminars have been held, in Athens and in Rio de Janeiro, and their reports¹ tell of the development and achievements of museum education services throughout the world during the past decade. In Australia, Canada, New Zealand, and South Africa, school services have been established by metropolitan museums which frequently serve a whole state as well as the immediate locality. New museums established in Asian and African regions usually have popular instruction as their primary aim, so that they form eminently suitable starting-points for co-operative work in schools. Nor is the Old World lagging behind in this resurgence of museum activities. In continental Europe, particularly in Holland and Scandinavia, a few museums are in the vanguard of the movement towards a more lively and organized employment of museum resources. In Britain there is increased support from education authorities; a few counties have followed the lead given by Derbyshire, while others are expanding the educational services from museums they already administer. In 1941, Glasgow Art Gallery and Museum, in co-operation with the City Education Authority, established a very comprehensive

¹ See Bibliography, seq.

Department of Education, aiming initially at providing an organized service for visiting schools, while eight years later, the National Museum of Wales Schools Service was inaugurated. This receives grants from the Welsh authorities, in return for which it provides both a service for visiting schools and a loan service to Welsh secondary schools.

The Educational Use of Museums

Museum facilities for schools, wherever they are provided at the present time, possess a common aim, but vary considerably according to circumstances. Obviously, the character of the parent institution, its geographical position, its administrative set-up, its social, educational and political environment, the size and nature of its collections, and even its origin and history affect the form of any educational service provided. Nevertheless, two principal ways in which schools make use of museums can be distinguished. In one, teachers take groups of pupils to study specimens in the galleries; in the other, they borrow museum specimens for use in the classroom. Few museums of any size are never visited by school parties, and even where there are no special provisions it is a regular practice, in the Western world at least, for groups of youngsters to enlarge their experience by visiting the local museum. Visits to institutions which make no specific arrangements for the reception of classes of children originate with individual teachers, and the value of the visit depends upon their skill in making the best use of what the museum has to offer. Fortunately the mass visit, in which large numbers of children tour galleries as part of a school journey, is becoming increasingly rare. Such visits have little to commend them, for instead of stimulating the young visitors they have the reverse effect, giving them a permanent distaste for these places, at best leaving them with mangled impressions of ill-digested facts and half-seen, half-understood things. Nowadays there is wider recognition of the importance of a purposeful visit which should serve not only to increase the child's knowledge, but which he should remember as a lively and enjoyable experience. Lesson time is precious, and hours spent outside the classroom must be well justified, so that when a museum visit is proposed it is usually a planned excursion connected with the normal course of study rather than an exhaustive tour of the galleries.

Where there are no special facilities provided by the museum, it is all the more important for the teacher in charge of the group to prepare the visit carefully, and to carry out some form of follow-up work in the classroom or during further visits. Careful preparation ensures that, once in the galleries, the maximum amount of time and energy can be spent in examining and discussing specimens, in sketch-

ing and in making notes, but however well prepared a visit may be, when children go from the familiar environment of their own classroom to somewhere where they are surrounded by unfamiliar and intriguing things—including other people—there is plenty to divert their attention and excite their curiosity. For this reason, many museums provide rooms where part of the visit can be spent free from distraction and where young people can indulge in different forms of activity without disturbing other visitors. Such rooms are frequently equipped with projectors, specimens for handling, and materials for drawing and modelling, and other creative work which sometimes extends into field work outside the museum, but is related to further study in the galleries. In the Leiden Ethnographical Museum in Holland older children are encouraged to write plays based on the collections, which they subsequently perform, using reserve material from the museum stores as stage properties. Other museums encourage work in the galleries instead of, or in addition to, activities in museum classrooms by providing stools, drawing-boards, work-sheets, and so on. Where there are schools' officers on the museum staff they are responsible for the conduct of the parties in the galleries and classrooms; sometimes arrangements are made to meet the special requirements of visiting schools, or there is a pre-arranged syllabus of classes or demonstrations.

The Value of Loan Services

Just as museum facilities for school visits range from the passive acceptance of school groups to highly organized museum education centres, so, too, do school museum loan services range from the occasional lending of isolated specimens in response to a request from an individual school to organizations with large and varied collections specially designed and arranged for classroom use and serving a wide area. More frequently, loan facilities are confined to schools within the city boundary, but obviously they are of special value to schools too far from a public museum to make regular visits a practical possibility. Nevertheless, the provision of such services is no substitute for visits, and is properly complementary to them, which is why museums catering for schools in a big way usually make provision for both types of service. There are, of course, certain drawbacks inherent in a loan service. Not only is the type of material circulated limited by such factors as size, weight, rarity or fragility, but the number of items lent to a school at one time is also limited, so that opportunities for the comparative examination of large numbers of related specimens is not possible in the way that it is during a museum visit. There are also advantages: for one thing, teachers can select the particular specimen they want and use it at the psychological moment in their normal classroom lesson,

or perhaps as part of a classroom exhibition, or integrate it with some project in which the children may be engaged. Time and expense in travel are not involved, and children are stimulated by the introduction of museum objects into their everyday surroundings where there are greater opportunities for handling or even using them, and where they remain long enough for each child to absorb and appreciate them at his own pace with the help of his teacher who is aware of his particular idiosyncrasies. In Britain and the United States it is common for loan specimens to be used by the borrowing teacher, but in some places, as with the travelling exhibitions circulated by the Royal Ontario Museum of Toronto, a museum teacher accompanies the material and interprets it to children in school. Where a museum loan service provides for schools in a small, compact area, it is customary for exchanges to be made at fairly frequent intervals of a week or so, but where the area covered is large and schools are scattered, the loan period is considerably longer, and may be for half or a whole term or even a year. The nature of the material itself also determines the length of the loan to a certain extent; pictures and sculpture, for example, can profitably remain in a school for a longer period than an archaeological study collection. But the essence of the loan material lies as much in its freshness to those who see and use it as to its availability for exhaustive study, and for this reason relatively long loan periods are undesirable, lessening as they do the effect of a continual series of new impacts on the senses of young people.

This brief account of the history and scope of school museum services indicates that while there is admittedly an awakening realization of the potentialities at hand, there is no room for complacency. Although in every continent something at least is stirring, although the majority of museums in the United States and an increasing number in Britain and continental Europe cater in some way for schools, it is well to realize that the vast majority of children at school in the world to-day are likely to go through life without ever entering the doors of a great museum, or of examining museum treasures close at hand in their own schools. If museums have anything to offer, as they surely have, great efforts are needed to provide boys and girls with wider opportunities of benefiting from them during their formative and enthusiastic years. Greater attention has still to be paid to the best ways of interpreting the things, of whatever kind, that form the elements of all museums, to the young and enquiring mind. The thousands of young people enjoying museum experiences in galleries and classrooms must be multiplied into millions, and even then only the fringe of a vast field of adventure and exploration into the visual records of man's environment will have been reached. The resources of the mass media

of human communication must be fully exploited in the museum field, so that even the most distant outposts of civilization can benefit from the treasures of the great capitals of the world.

A century ago museums in the United States and Britain first held out a helping, friendly hand to the child at school; in many parts of the world there is as yet barely a touching of finger-tips. Continued striving is necessary everywhere before both hands can join in a firm grasp of complete understanding.

BARBARA WINSTANLEY.

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CHAPTER TWO

Museums of Sound—History and Principles of Operation

ALTHOUGH such inventions as Leon Scott's phonautograph, dating from 1857, did in a sense record sound by making a visual record of sound waves, the phonograph, invented in 1877 by Edison in America and—independently—by Charles Cros in France, was the first machine which recorded sounds in such a manner that they could be audibly reproduced.

Unfortunately, the new invention's potentialities as a means of providing posterity with aural evidence of those aspects of civilization which are expressed in sound were largely neglected. In its earliest days the phonograph was mainly exploited as an office-dictating machine or as an amusing novelty which enabled its owner to record and hear his own voice and those of his friends. Furthermore, when 'pre-recorded' cylinder recordings began to be published they were, as a rule, of little aesthetic or historical interest, consisting for the most part of such items as humorous monologues, comic and popular songs, bell solos and marches.

However, some eminent people did make records: the first musician of standing to record was the great pianist, Josef Hofmann (1876–1956), who made his debut at the age of six, and at the advanced age of twelve made some experimental cylinders for Edison.¹ Other celebrities known to have made records very early in the history of the phonograph include Bismarck (1815–98), Brahms (1833–97), Browning (1812–89), Gladstone (1809–98), Gounod (1818–93), Irving (1838–1905), Florence Nightingale (1820–1910), Renan (1823–92), and Tennyson (1809–92).

But it was the students of folk music and of linguistics who first made serious and extended use of the phonograph for research purposes, and it was their activities which led eventually to the establishment of the first archives of sound recordings. The reason for this was, of course, that the phonograph provided a solution of what for them had hitherto been an insoluble problem: the accurate registration—impossible by written notation, however complex—of the subtle inflections, irregular rhythms and microtone intervals of the music and language of non-literate or 'primitive' peoples.

¹ Roland Gelatt, *The Fabulous Phonograph*, English edition (London, 1956), p. 98.

Archives of Sound Recordings

What is generally taken to be the first instance of the use of sound recordings in academic research in the humanities and of their deposit in a museum as research material occurred when, in 1889, Dr. J. Walter Fewkes recorded some prayers, tales and songs of the Passamaquoddy Indians in the eastern part of the United States; from 1890 he also recorded some Zuni and Hopi songs, and some of these were transcribed by Dr. Benjamin Ives Gilman of Harvard, the recordings being deposited in the Peabody Museum.² The use of the phonograph for similar purposes in Europe was begun in Hungary in 1898 by Béla Vikar, and continued from 1904 onwards by Béla Bartók, Zoltan Kodály, and others, thousands of their recordings finding a home in the Hungarian National Museum in Budapest.³

It is, however, to Austria that credit must be given for establishing the first *comprehensive* archive of sound recordings. The plans for this institution, the *Phonogramm-Archiv* of the *Akademie der Wissenschaften* in Vienna, were drawn up by Professor Siegmund Exner, and are dated April 27th, 1899. They were as follows⁴:

(1) *Languages*. Initially, to survey the languages and dialects of Europe, as spoken at the end of the nineteenth century, and gradually to extend this survey throughout the world.

(2) *Music*. To record performances of music, in particular the music of primitive races, for study on a comparative basis.

(3) *Voices*. To form a collection of the records of the voices of famous people.

The catalogue, published in 1922, of the first 2,000 accessions, shows that the collection—which contained few if any commercial records—was rich in folk music and linguistic matter recorded in many parts of the world by expeditions sent out by the *Phonogramm-Archiv* itself or obtained by exchange from foreign institutions. There were also a few scientific records and a large number of 'voice-portraits', including the voices of Franz Josef I, Einstein, Puccini, and—reading extracts from

² *Journal of American Folklore*, Vol. III, No. X (1890), article by J. Walter Fewkes; *Journal of American Ethnology and Archaeology*, Vol. I (1891) and Vol. V (1908), articles by B. I. Gilman.

³ Béla Bartók, *Hungarian Folk Music*, English translation by M. D. Calvocoressi (Oxford, 1931).

⁴ *Mitteilungen der Phonogrammarchivs-Kommission der Akademie der Wissenschaften in Wien*, No. 1. Bericht über die Arbeiten der von der Kais. Akademie der Wissenschaften in Wien eingesetzten Kommission zur Gründung eines Phonogrammarchivs (1900); No. 58. Das Phonogrammarchiv der Akademie der Wissenschaften in Wien von seiner Gründung bis zur Neueinrichtung im Jahre 1927, by Leo Hajek (1928).

their own works—Hugo von Hofmannstal, Arthur Schnitzler, and Ferdinand von Saar.⁵ The collection, as detailed in this catalogue, did in fact provide a conspectus in sound of Viennese civilization as it was during the first dozen or so years of the twentieth century.

Between 1899 and the outbreak of the Great War in 1914 many record archives were established, often as departments of university institutions or of national libraries. One of the most important was the Berlin *Phonogrammarchiv*, founded in 1904, which was for many years until 1933 directed by the eminent ethno-musicologist, Erich von Hornbostel, under whom an unrivalled collection of folk music was built up.⁶

Other collections of outstanding importance include the *Phonothèque Nationale* in Paris, which developed from an archive which has existed in one form or another since 1911,⁷ and the *Discoteca di Stato* in Rome, which was founded in 1928 at the instigation of the composer, Umberto Giordano.⁸ Both these institutions benefit from legal deposit laws under which record manufacturers are obliged to furnish on demand two copies of any record published in France or Italy respectively.

The largest collection in the world is that of the Library of Congress in Washington, the nucleus of which was the Archive of American Folk Song, set up within the library in 1928. There is no legal deposit law applying to records in the United States, but the principal American manufacturers have for many years given their records to the library, which also possess some hundreds of thousands of recordings made by government departments, and many recordings of important broadcasts.⁹

Among other important American archives are the general reference collection in the New York Public Library¹⁰ and the extremely comprehensive library of recorded literature in the Poetry Room at Harvard University. In general, the provision of facilities for the study of records—both reference and circulating libraries—in universities,

⁵ Katalog I der Platten 1–2000 des durch die Mittel der Treitel-Stiftung gegründeten und erhaltenen Phonogramm-Archivs der Akademie der Wissenschaften in Wien (1922).

⁶ Erich von Hornbostel, *Zeitschrift für vergleichende Musikwissenschaft*, Jahrgang I, No. 2 (1933).

⁷ *Revue de Phonétique*, 1911, tome premier, premier fascicule, p. 103; deuxième fascicule, p. 197.

⁸ *Italian Affairs*, Vol. IV, No. 4 (July, 1955), pp. 877–9.

⁹ *Folk Music of the United States and Latin America: Combined Catalog of Phonograph Records* (Division of Music, the Library of Congress, Washington, D.C., 1948), p. iii; *Library of Congress Annual Reports*, 1940 onwards.

¹⁰ *Bulletin of the British Institute of Recorded Sound*, No. 5 (Summer, 1957), pp. 20–22, article by Philip L. Miller.

public libraries, and elsewhere, is far more widespread in the United States than elsewhere.

Apart from general collections, many specialist archives containing records of great value have been established. The Department of English at Leeds University, in England, for instance, has undertaken a recorded survey of English dialect¹¹; a similar survey of German dialect has recently been completed by the *Deutsches Spracharchiv* at Münster, and there is an outstanding folk music archive in the Department of Musicology in the *Musée de l'Homme* at Paris, the value of which to the world at large is greatly enhanced by the publication—either by the museum itself or by commercial firms—of many records of material from its collections.¹²

Several private collections are in existence which contain unique material of great value. Two of the most important are the collections of Dr. Walter Toscanini in New York and Dr. Garcia Montes in Havana. Dr. Toscanini has for many years been engaged in forming a collection of recorded performances conducted by his father, Arturo Toscanini. Apart from all the published records, the collection, which is very extensive, contains unpublished tests and recordings of broadcasts.¹³ Dr. Garcia Montes' collection contains most of the records by opera singers of any importance published during the last forty or so years anywhere in the world.¹⁴

Nowadays, most broadcasting organizations maintain record libraries of one sort or another; unfortunately, many of these resemble circulating libraries rather than archives, since as their stock wears out or goes out of fashion it is replaced by newer publications and there is little effort to safeguard those recordings which are of historical interest. However, some radio collections are archival in character; one of the earliest and most impressive was that established by the German radio before World War II. It consisted not of commercial records but of recordings made by the radio itself from broadcasts considered to be worthy of preservation. There is an astonishing wealth of material in the two catalogues covering the years 1929–39, and it will be regrettable if it transpires that the bulk of the collection did not survive the war. Apart from foreign material, the collection of some 50,000 recordings included the recorded voice of almost every eminent German dur-

¹¹ *Bulletin of the British Institute of Recorded Sound*, No. 1 (Summer, 1956), pp. 2–6, article by Stanley Ellis: "Mechanical Recordings for the Linguistic Atlas of England".

¹² Collection *Musée de l'Homme* (Paris) (Paris, UNESCO).

¹³ Robert C. Marsh, *Toscanini and the Art of Orchestral Performance* (London, 1956).

¹⁴ *The Gramophone*, Vol. XXXVI, No. 422 (July, 1958), p. 47.

ing the period—statesmen, leaders of industry, actors and actresses, authors reading their own works—and a remarkable repertoire of familiar and unfamiliar music of all kinds, performed by the best interpreters and often by the composers themselves.¹⁵

In the United Kingdom the B.B.C. maintains two very large record libraries: the B.B.C. Gramophone Library, which contains commercial records only, and the B.B.C. Recorded Programmes Permanent Library, which consists of non-commercial records such as those which the B.B.C. makes itself or obtains from foreign radios. The B.B.C. Gramophone Library, which contains more than 250,000 different records, is less like an archive than the other library, since although great care is taken of unusual or out-of-print records of obvious importance, the first object of the library is to serve current programme needs, and this necessitates the handling of records by unskilled staff outside the library and their despatch to radio stations throughout the B.B.C. network. The B.B.C. Recorded Programmes Permanent Library—which contains about 30,000 recordings—has, on the other hand, been built up as a collection of historical sounds which can be used in future programmes, and its contents illustrate every aspect of life in Britain during the last quarter of a century.

Both these libraries are for the internal use of the B.B.C.; there is, however, one other archive in Britain which aims to be universal in scope and which is also intended to serve the general public. This is the British Institute of Recorded Sound, which was established in active operation in 1955 and which during the four years since then has acquired some 45,000 recordings by gift, exchange, or purchase; the current rate of intake is about 1,000 records a month, and the collection includes commercial records, British and foreign, some B.B.C. recordings, and many obtained from overseas institutions and from private collectors, for example, of folk music recorded in the field. In addition to the records themselves the institute is forming a collection of related written matter—such as record manufacturers' catalogues from all parts of the world, books and periodicals about records, and documents relating to the record industry.

Principles of Operation

The problems facing the record archivist may be divided into the following four categories, which to some extent overlap: acquisition, preservation, service to the public, and legal questions.

It is assumed that in each country there should and indeed eventually

¹⁵ *Schallaufnahmen des Reichs-Rundfunks G.m.b.H. von Ende 1929 bis Anfang 1936; von Anfang 1936 bis Anfang 1939.*

will be something in the nature of a national deposit library or archive which will obtain records in the following categories :

- (i) Commercial records published in the country in which the archive is situated or manufactured in it for publication abroad.
- (ii) Commercial records published abroad by foreign manufacturers.
- (iii) Recordings produced by radio organizations.
- (iv) Private recordings and those produced by institutions; and
- (v) Unpublished commercial records.

It is considered that ideally each national archive should follow a few principles thought to be fundamental. In the first place, in order to prevent losses caused by pressure for economy or by changes in taste, the archive should be prohibited from disposing of any record of which it has only one copy. A second principle rejects for a national archive the form of a chain of specialist libraries; it is felt that what is needed is a fully comprehensive collection containing sounds of all kinds. The existence of such an archive would not prevent the establishment by—for example—universities and learned societies of specialist collections, and if this led to a certain amount of duplication it would be a good thing; accidental damage to a valuable record would not then be an irreparable disaster.

The third principle is non-selection; in practice this would mean that the archive would select only if forced to do so. Any record offered to it which was in reasonable condition would be accepted for preservation if it were in a form considered to be permanent; by this is meant, in effect, processed discs, published or unpublished. There should be rigorous selection of records of doubtful permanence—such as cylinders, instantaneous discs, and tapes. To say that the archive should reject selection as a principle does not mean, of course, that it would not make greater efforts to obtain some records than others.

If, for policy reasons, some selection of processed discs were necessary, it would probably be wise to try to restrict it to certain kinds of English and American 'light' music; by this is meant what is sometimes called 'salon' music and also 'commercial' dance music. Some people may wonder why a serious institution should bother itself at all with popular music; but even if of little aesthetic value, popular art in any medium may be of considerable sociological interest, and there seems to be a good case for the preservation at least of samples of all kinds of popular music and entertainment in their various stages of development.

A fourth fundamental principle is the need for documentation; every record must have kept in association with it any relevant texts or other related matter. The desirability of this will be evident in the case of folk music, folklore and linguistic records, but it is considered that the

principle applies no less to other categories. The albums and sleeve notes, libretti, and other written material which are sometimes available in connexion with records should not be dissociated from them, but should be treated as part of a discographical entity.

With regard to acquisition, a law of legal deposit or a voluntary agreement with the record industry would cover all records under category (i) above. It should be noted that in most of the principal record manufacturing countries the industry has an extensive export trade in records not intended for the home market; these records are often of great importance, and steps should be taken to obtain copies for the archive as soon as they are manufactured.

It is essential for a record archive to obtain regular information about all commercial records available abroad as well as in its own country. Many records of great importance have been published by short-lived mushroom companies, and even in the case of the larger manufacturers it is normal practice to delete records from the catalogues if, for example, their sales are considered to be insufficient. Once a record goes out of print it may be very difficult and expensive to obtain a copy, and these difficulties will be much greater in the case of foreign records.

The introduction of tape recording has led to the recording on a large scale of performances for broadcasting and also to the recording of broadcasts; there is an international agreement between radio organizations under which a recording made by any one of these bodies may be made available to its fellow organizations abroad. Many of these recordings are of great historical or artistic value, and it would be a great step forward if an international agreement could be drawn up under which it would become permissible for such radio recordings to be deposited in any of the constituent non-radio archives of an interlinked system.

The recordings are, as a rule, made under agreement with performers' unions, copyright organizations, and other interested bodies, and the existence of these agreements is presumably reflected in increased fees payable in respect of recordings intended to be made available for exchange with overseas broadcasting stations. There are, however, few problems facing record archives which are more urgent than the necessity for establishing machinery which would enable a reputable non-radio archive to obtain a copy of a recording made by the broadcasting organization of another country.

The law regarding the recording of broadcasts varies from country to country; in Britain it appears to be obscure and there are many anomalies. Amateurs regularly record broadcasts and exchange them

with one another, and it seems that the law gives sanction to the casual collector which it denies to the archivist.

The acquisition of private recordings presents few problems, since private collectors are as a rule very generous in allowing an archive to copy their recordings; the source is particularly valuable in providing folk music recorded in the field.

Perhaps the class of record which raises most difficulties for the archivist is the unpublished commercial record, of which vast quantities exist in the vaults of the record companies. It may happen, for example, that one member of the cast of an opera, dissatisfied with his own performance, will refuse to authorize publication of the record. Its acquisition by a public archive may then raise a moral problem; it can be argued that if an artist will not permit the publication of a record it should be destroyed. But sometimes refusal to authorize publication does not signify that the artist is dissatisfied with it; there have been cases, for instance, in which it has been alleged that authority to publish was refused because of disputes over fees.

In general, it would be desirable for unpublished records to be treated as manuscripts are treated and for accredited archives to be able to acquire copies which could be made accessible for study, the relative catalogue entries making clear that the performance had not been approved by the artists.

With regard to the preservation of valuable sounds, cylinders and instantaneous discs (sometimes known as 'acetates') cannot be regarded as satisfactory media; the former are bulky and fragile and liable to fungoid growths, and according to an invaluable pioneer work now in the press, the *Library of Congress Report on Preservation and Storage of Sound Recordings* (Washington, D.C., 1959), the latter, even if kept sealed under ideal conditions, are liable to sudden and complete disintegration of the emulsion on which the recording is engraved. If kept under suitable conditions of temperature and humidity and free from abrasion and pressure, processed discs—either shellac or plastic—may be regarded as satisfactory means of long-term storing of valuable sounds. The position of tape recordings is not so clear; it is obvious that a tape is in some ways an unsafe medium. It is easily erased and, if carelessly handled, may be broken or stretched. Other less obvious possible faults, which may vary according to such factors as the nature of the base material, are de-magnetization, printing (the spreading of the recording from layer to layer), and physical deterioration.

In the actual operation of an archive there are a few simple principles, the observation of which will reduce the chances of damage to valuable records. For instance, members of the public should not be allowed to handle records; they should listen to them by means of

headphones or through a loudspeaker in a listening room connected by telephone with the operator. It is also important that any members of the staff who handle records should be trained in their use. In order to prevent wear, any extracts from a record which a listener wishes to have repeated over and over again should be dubbed on to a tape loop, a device which allows continuous repetition. Permission to do this would have to be obtained from the copyright owners, but it is to be hoped that they would be ready to grant a blanket authority covering cases of this kind to a national archive.

Although the acquisition of valuable records and their safe keeping are the first tasks of an archive and an inaccessible archive is better than none at all, mere possession is not an end in itself. In the long run the *raison d'être* of the archive is the public service which it can provide. This will depend largely, though not entirely, on the existence of a satisfactory catalogue.

In addition to providing a listening service, the archive should act as an information and documentation centre and should publish a periodical and occasional monographs on various aspects of recorded sound. Recitals of recorded music, poetry, and drama would also be both valuable in themselves and an effective means of drawing the attention of the public to the educational potentialities of the archive itself, and indeed of the still comparatively youthful medium of sound recording.

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CHAPTER THREE

Modern Developments in Library Services

THE extraordinary and unprecedented growth in the quantity of research and publication in recent years has brought with it a testing time for libraries. Formerly the task of the librarian was to collect books recommended to him by scholars, or books that were significant in bibliographical history, or books recognized as standard works, and to catalogue and preserve them so that they would be easily available when requested. It was taken for granted that the reader in a library knew exactly the books he wanted to study, and the librarian therefore concentrated on collecting and organizing. He did not, usually, make any attempt to guide a reader through the literature of his subject; and indeed when a scholar could be reasonably sure of knowing, either personally or by reputation, everyone working in his field and everything they published, there appeared to be little need for such bibliographical guidance. Little scholarship attached to professional librarianship, therefore, beyond skill in cataloguing and descriptive bibliography, and librarians tended to base their claim to the title of 'scholar' not on professional qualification, but on extensive knowledge of a recognized academic subject. The great librarians of the past were men who, though renowned for their contributions to scholarship, distinguished themselves professionally only as collectors and administrators. Such techniques as classification and subject indexing were certainly known, but in a primitive form and without much theoretical foundation. Attempts to study these foundations were regarded with such contempt and suspicion that the first group of British librarians that met to discuss them in about 1912, called itself the 'Anonymous Club' in order to avoid public obloquy. Academic qualification, in fact, was held to be a sufficient guarantee of professional competence, as in the teaching profession.

The changing circumstances that now challenge librarians have been caused by the vast extension of education and research, together with the equally vast improvement in methods of communication. Now, there may be scores of centres for the study of a particular field where only two or three existed thirty years ago, and hundreds of individual specialists where formerly they were numbered in tens. Estimates of the number of research papers published each year run into millions. In the face of this torrent, the research worker is now obliged to call

for the assistance of someone to organize the literature; not as in the traditional library, to collect and catalogue only, but to examine, sift, classify, index, and disseminate the information contained in the literature. The situation is seen most vividly in the libraries of applied science, but in the social sciences and even in the humanities there is an increasing tendency for the research worker to call for information about a particular subject rather than for particular, probably well-known, books.

While it could scarcely be claimed that librarians themselves were the first to recognize the changing bibliographical scene, nevertheless we can now say with reasonable certainty that the contribution that the new forms of librarianship can make to the progress of knowledge is generally appreciated. This is particularly true in specialist fields. The libraries of industrial scientific research led the way and remain the pacemakers, and other institutions are now beginning to rely more and more on their libraries for a continuous service of newly published information. The techniques of librarianship are being developed in many interesting ways in order to cope with the new demands of research workers, and it is convenient to consider these developments under three main headings:

- (1) New methods and techniques,
- (2) New forms of documentation,
- (3) New libraries.

New Methods and Techniques

The new methods have been devised to impose order and discipline upon the chaotic assortment of literature that flows daily into libraries. They began in their present characteristic form in industrial libraries, where the pressure is very strong on librarians to give a continuous service of current information and a quick response to a request involving a retrospective search into the literature. This kind of service became possible in industry for various reasons, among them the tendency of industrial scientists to work in teams, giving to one member of the team the responsibility for organizing and using the literature on behalf of his colleagues. No questions of personal pride or academic integrity arose; the main job of the scientists was to produce results, and as this division of labour proved to be a more efficient research method, it was naturally adopted.

It may be thought that while this arrangement may work satisfactorily in scientific research, where literature searching usually aims at collecting factual data, it could not be imitated in other fields where value judgments predominate. It cannot be emphasized too often, however, that the function of an information service is to help research

workers to obtain relevant material and not to evaluate the material. A librarian can act as a scout or lookout, but only a research worker can tell whether a particular new publication adds anything to his knowledge of his subject. There is, in fact, little danger of the service becoming a barrier instead of a filter.

There has been some disagreement over this matter; but if we accept this statement of the proper role of an information service, then no scholar need fear any qualms of professional conscience if he accepts it from his library. He will certainly see more, and not less, relevant material, and on the other hand he will see less that is irrelevant to his work. I can see no reason why such a service should not be considered acceptable in all fields of scholarship. No doubt there exist some specialist fields that are even now cultivated by only a few scholars who all know each other, but outside of these a professionally qualified librarian can certainly make a valuable positive contribution to research.

The various facets of the information service are actually no more than logical extensions of traditional library practice. If the librarian is professionally expert in tracing new material that should be in his library, and in maintaining close contact with the producers and publishers of such material, it is reasonable that he should inform those interested in his new acquisitions; and a bulletin of accessions has been commonly found in libraries of all types. And since the latest research material is nowadays mainly to be found in the journals, it is even more vital that the library should assume the responsibility for scanning all newly received journals and for bringing their contents to the notice of those who might be interested. This may sound a tall order, and it does involve a fairly close knowledge of the interests of the library's users. For this reason, libraries in specialist institutes have a much better chance of establishing a service of current information than a large general library. But it should be remembered also that the service need not cover those journals that the specialists would normally read regularly—only those outside the normal range. For example, it can be assumed that a teacher of religious education will normally read each issue of *Religion in Education*; but he will be glad to be notified of an article on religious education appearing in, say, a journal of educational sociology. Equally the sociologist will be interested in an article on the social value of religious education if it appears in *Religion in Education*. Similar instances occur every day, and it is in the controlling of these cross currents that the librarian can give valuable help, for nowadays one of the things that definitely cannot be expected is that a scholar in the field of education should read everything published in this field, and it has long been well-known that

articles on a particular subject are scattered over an unexpectedly wide range of publications. For example, this article on librarianship appears in *THE YEAR BOOK OF EDUCATION*.

The essence in notifying new work to individual scholars is speed; the information should aim at reaching its target on the day of publication. Operating such a service soon leads to the realization that such a systematic control of all new literature not only derives the maximum benefit from it, but also lends itself to cumulation. The compilation of bibliographies, indexes, and abstracts follows. Many scientific libraries compile their own bulletin of abstracts, partly because of the delays that seem to be inseparable from the production of printed abstracts, and partly because the diversity of their interests means that no published abstracting journal gives an adequate coverage of their material.

The situation in educational literature shows some encouraging signs but offers a great deal of scope for improvement. We have the H. W. Wilson Co.'s *Education Index*, which gives a very good coverage of U.S.A. material, but does not provide abstracts. Only a very few journals published in other countries are indexed. Probably this is a wise decision, however hard on libraries in other countries, because if the index grew too large it would doubtless be very expensive, and might be forced to give up another valuable feature—the cumulation of issues at intervals of two months. The British literature has been covered in recent years by the *Index to British Educational Periodicals*, compiled as a co-operative venture by the librarians of the University Institutes of Education. A cumulation of the first four years' issues is being published by the Library Association, and it is hoped that further cumulations will follow. Similar indexes appear at various intervals in other countries, and the International Bureau of Education in Geneva issues a list of new books with its *Bulletin*, and cumulates the lists into an annual volume, the *Annual Educational Bibliography*.

So far there has been little systematic abstracting in the two chief English-speaking countries, though facets of our field appear as sections of other abstracting services, such as *Psychological Abstracts*, *Child Development Abstracts*, and *Sociological Abstracts*. The *Foreign Education Digest*, from California, gives a survey of current developments, but only in countries outside the U.S.A.

We have to look to Commonwealth countries for collections of abstracts over the whole subject: *Indian Education Abstracts* has now reached its fifth volume, and *Australian Education Abstracts* began publication in mimeographed form in 1958. If we are to avoid the unnecessary proliferation and consequent duplication of bibliographical aids that exist in the natural sciences, it seems obvious that each country

or appropriate group of countries, should undertake to service its own literature; the collection would then be reasonably certain of covering the whole world.

There has been some controversy over the relative merits of indexes and abstracts. It has been argued that abstracts may be the better form in the natural sciences, where the search is so often for factual information which can be included in an abstract; but that in the social sciences and the humanities, where value judgments are usually involved, it would be impossible to make satisfactory abstracts, and that the extra effort would largely be wasted. I remain unconvinced by this argument. After some experience of both, I am sure that, in education at least, the superiority of an abstract over an index entry, as a guide to the searcher, is great enough to warrant the use of abstracts wherever possible. This follows the development in the natural sciences, with the proviso that we should profit by their mistakes and try to bring in from the start all the necessary co-operation on the international level.

There will probably always be a demand for the occasional specialist bibliography, which may vary from a few items to many thousands. We can still refer with profit to some of these found in older editions of encyclopedias such as Monroe or Britannica. The bibliographies in the *Review of Educational Research* and the N.S.S.E. Yearbooks are invaluable, even though they tend to concentrate on the American literature. The *Education Libraries Bulletin* of the London Institute of Education, whose main object is to publish accounts of libraries and their activities, also includes the bibliographies of recent publications on very specific subjects that are compiled by the library staff in response to inquiries. Recent examples are "The teaching of English as a foreign language", and "The teaching of philosophy in sixth forms".

Most indexing and abstracting services began so that research workers could be kept aware of current publications, but an even more valuable use is for the retrospective literature search, which should be the automatic preliminary to any piece of research, no matter what the subject. It is in order to fulfil this function that many of these services, for example the *Education Index*, provide periodic cumulations. Libraries have traditionally kept their catalogues and indexes on cards, because new cards can be interfiled as the new items are added to stock, thus keeping the index up to date. Several interesting and even revolutionary new ideas are now being discussed for the recording, storing, and searching of cumulative indexes.

The *Education Index*, like all the H. W. Wilson Co. indexes, ostensibly arranges its contents in an alphabetical sequence of subject names,

with an elaborate cross-linking system of 'See also' references. The apparent simplicity of this method should not blind us to its numerous snares; and the superiority of a classified system has been argued and demonstrated many times. In fact, the network of cross-references in a 'dictionary' index constitutes a concealed (and usually half-hearted) scheme of classification. Furthermore, most of the criticisms of classified arrangements turn out to be based on the use of out-dated and incompetent systems. Much of the recent research in librarianship, particularly in England, France, Holland, and India, has been devoted to new types of classification system which are much more efficient.

The principal technique by which these new systems are formed is known as 'facet analysis', and was first developed by S. R. Ranganathan, then librarian of Madras University. The prototype scheme—Ranganathan's own Colon Classification—has run into five editions, and many other systems for specialized subjects have been based on the same technique. It differs from former classification systems in that it does not attempt, as they do, to make a place for every complex subject that occurs in the literature. Instead, it consists of a series of independent, unconnected lists of the simple elements that go to make up such complex subjects, and then combining them as required by the documents to be classified. These lists of elements are called 'facets', because they represent the various aspects of the subject. Thus in the Colon Classification, Education is Class T; the first facet is a list of Educands (children, adolescents, adults, male, female, exceptional, and so on), the second facet is a list of Problems (curriculum, teaching methods, aids, measurement), the third facet contains Subjects. The facet notations are joined together, for a complex subject, by punctuation marks. Thus, "Audio-visual methods of teaching algebra in elementary schools" would be classified as: facet 1 Elementary school—T15; facet 2 Audio-visual method—31; facet 3 Algebra—(B2). The notation for the whole subject is therefore:

T15: 31, (B2).

The highly mnemonic nature of these symbols is shown by the fact that 15 is also the number in class S Psychology for 'Pre-adolescent children', and B2 is the number in class B Mathematics for 'Algebra'.

Similarly we can take these examples from Class S Psychology:

S55 Female	S76 Negro
S: 255 Colour sense	S: 76 Intuition
S55: 76 Intuition in women	
S76: 255 Colour sense in negroes	
S55: 255 Colour sense in women	
S76: 76 Intuition in negroes	

The simplicity and flexibility of this form of construction can easily be seen. The Colon system itself, however, has not been widely adopted and lacks detailed development. The method is the important contribution, and it is the basis for a new classification of the Social Sciences being compiled by Miss Barbara Kyle for the UNESCO Social Science Bibliographies. A new system for Education should be developed as an extension of the Kyle system, because none of the systems now used in educational libraries is modern enough to be satisfactory in use. Recent work on a system for the documentation of Community Development in the Community Development Clearing House at the London Institute of Education indicates that such extensions can be integrated into the system without difficulty.

In the U.S.A., the U.S.S.R., and in some European countries, developments took a totally different direction. The complexities of modern scientific literature long ago emphasized the inadequacies of conventional classification systems such as the Dewey Decimal Classification and the Library of Congress Classification. Even the Universal Decimal Classification, which has been under systematic revision by experts since before 1900, has been severely criticized. This dissatisfaction led to the investigation of entirely new systems of indexing, beginning with the edge-punched cards that became well-known during and just after the Second World War. These at first seemed to provide a brilliant alternative to card indexes. The cards are oblong in shape with a double row of holes along each edge. Each hole is numbered. The subject is divided up, as in facet analysis, and each simple term is also numbered, so that each term corresponds to a hole in the card. To code a card so that it represents a complex subject, the holes corresponding to the numbers of each term are selected, and the edge clipped out. The title or an abstract of the article coded can be typed on the centre of the card, as for a conventional index; a pack of cards then represents a number of articles.

To search for articles on a particular subject, the whole pack of cards is taken and a knitting needle pushed through the hole that represents the first term in the subject. It will be clear that those cards whose edges have been clipped out will fall off the needle; the others will remain on it. The needle is then pushed through the hole representing the second term, in the pack of cards that fell off the first time. Fewer cards now fall off. This process is repeated for each term in the subject, and the last set of cards that fall off the needle contain articles that deal with all the terms in the subject; for example, 'elementary schools' and 'Audio-visual aids' and 'algebra', on three sorts with the needle.

The great advantage of punched cards is that they need not be filed

in any order, so that the labour of sorting by hand into a fixed sequence is avoided. Equally it soon became clear that, since the capacity of a needle cannot be much more than a thousand cards, this is a very cumbersome method for any but the small personal index. For these, it is a very good system. Another drawback is that the coding capacity is limited to the number of holes round the edges of the cards, which is not very large.

Attention therefore turned to centre-punched cards sorted by machines. The capacity of the cards is higher; sorting is much faster and does not require a human sorter; and more than one subject can be sought for at once. Once again, however, there are serious disadvantages. The cost of hiring the necessary machines probably makes this method out of the question for most educational organizations. The most economical machines will sort about 30,000 cards an hour—a comparatively small number when we consider the number of articles published each year—so that it might take several hours to search through a whole index. Of course, this search is necessary for every inquiry, otherwise the great advantage of not having to file in a fixed sequence is lost. Finally, the wear on the cards continually passing through the sorting machine is considerable, and they need to be replaced much more often than is desirable. Not much attention need be paid to this form of literature searching, though many existing systems have been described, some of them containing hundreds of thousands of cards. The most modern electronic statistical machines will work much faster, but are also much more costly.

A more attractive system introduces yet another kind of approach to indexing by using what have unfortunately to be known as 'peep-hole' cards. One American system even uses the name 'Peek-a-boo'. In this system each card represents, not a document, but a term; the documents themselves are numbered. The card is ruled like a sheet of graph paper, each square also being numbered. The square representing the number of a document is punched out of each card whose term appears in the subject of the document. When a complex subject is sought, the cards for the terms in the subject are taken from the pack and held up to the light. Light shows through the squares representing the numbers of all documents which treat of the whole subject. This is an ingenious system, and easy to use for a small personal index. The cards have to be sorted into some convenient order, of course, so that the appropriate term cards can be removed when wanted; also, the capacity of the cards is limited. A Dutch system can hold 10,000 numbers, the 'Peek-a-boo' up to 18,000. Higher numbers are attainable with stronger material than card, but this, of course, is more difficult to perforate.

Two other forms of machine literature searching that are currently arousing great interest but which are still only in the experimental stage use microfilm and magnetized tape. The prototype of the machines scanning film was the Rapid Selector designed by Vannevar Bush and Ralph Shaw, then librarian of the U.S. Department of Agriculture. Each frame on the microfilm was divided into halves; one half carried an abstract, the other the code symbol of a document. The code symbol was made up of a pattern of clear and black squares, and when the machine was lined up to search for a given subject, it matched the subject code with those on the frames. Each time a match occurred, the machine stopped for an infinitesimal period while the abstract was printed. Thus the result of a search was a collection of prints of relevant articles. Other more modest film using systems have been devised in France and the U.S.A.

Finally we come to the giants of the machine world, the computers that read magnetized or perforated tape. Of course, these machines are also very costly, and they suffer from much the same disadvantages in terms of search time and wear of tape or film. But they can store an immense amount of information in a comparatively small space, and are very much faster than the punched card machines. A great deal of research is now being conducted into the use of these computers for literature searches.

My own main objection to all such 'hardware' is not to their performance but to their suitability; they are, after all, not designed for literature searching, in which the main problem consists of establishing relevances—the relevance of the documents examined to the inquirer's needs. Machines are primarily designed for data processing; that is, analysis, comparison, co-ordination, statistical treatment, and so on, of specifically defined facts. I cannot see that any machine yet made or even suggested can replace the brain of a skilled searcher for information, because no machine can do more than what it is told to do, whereas any experienced librarian knows that the answers to the most complex problems are often found by following up the unexpected line of search. If only the merest fraction of the resources lavished on machinery, particularly in the U.S.A. and the U.S.S.R., were diverted to completing the work being done (largely as a spare-time exercise) on modern techniques of classification, libraries could soon expect much more practical results.

New Forms of Documentation

Like all these new techniques, a number of new forms of documentation have also arisen, and once again we can benefit from the experience and mistakes made in this field in science and technology. We

must beware particularly of the mimeographed report which is 'not published, but achieves circulation'. These are the documents that are written primarily for internal use within a research organization, but which are also in due course distributed more or less freely without recourse to the usual publishing channels, and therefore without coming under the control of the bibliographical services that do exist. The mimeographed report is also now being widely used to avoid the delays in publication so commonly found with research journals. Another dangerous practice is that of circulating separate pre-prints to those attending conferences of which the proceedings are not subsequently published. Those who attended soon begin to quote these pre-prints in their own writings, but no one is able to obtain copies because the supply has been exhausted or the conference secretariat has been disbanded. It was recently suggested to UNESCO and the Royal Society that international bodies might help by listing conferences in their publications, so that there might be at least one official record. If a set of pre-prints were also deposited with appropriate libraries, the situation would be made much easier for future research.

Fortunately we do not yet suffer much in education from these elusive but often vitally important productions. Our research organizations have a good record of genuine publication, and a widespread system of exchanges ensures that a new work is often well known even before it appears in the national bibliographies or the specialist indexes. One form, however, comes perilously near to deserving similar criticism: the university thesis. It is no doubt perfectly in order for writers to quote theses to which they have had access through a university library, but it can prove extraordinarily vexing for the research student who finds that he cannot pursue the reference because he has no access to a library able to borrow it. Already some universities will lend theses to private borrowers and it is likely that greater availability will be forthcoming as their value becomes generally recognized.

Thesis bibliography varies in efficiency but is improving. Probably the U.S.A. leads with its *Dissertation Abstracts*, and Great Britain has a reasonable service, with some duplication, in Blackwell's *List of Researches in Education and Educational Psychology, 1918-1948*, with its several supplements, and the *Index to theses accepted for higher degrees in the Universities of Great Britain and Ireland* published by Aslib annually since 1950. A number of universities and university institutes publish lists or abstracts of their own theses or of theses in their subject.

One means of making theses more easily available is to film them, and this practice is now very common in the U.S.A. Many universities will supply at cost copies of their own theses, and University Micro-

films Inc. offer to supply theses appearing in *Dissertation Abstracts*. Microfilming, in fact, has become generally popular both for obtaining difficult material and for economizing on storage space, in spite of considerable resistance from library users, who were for a long time very unhappy with the machines they had to use to read the film.

The use of miniature documents has a long and interesting history, and microfilm is almost as old as photography itself. It was regularly used for military, diplomatic, and newspaper purposes during the siege of Paris in 1870, and during the Second World War almost unbelievable reductions were used with great success, particularly by spies. Probably the first library use was the filming of long runs of bulky periodicals: *The Times* and its *Educational* and *Literary* Supplements are all available on film. Originally, copying was done on the ordinary spool or roll of film, but this is not at all suitable for some kinds of document. Reference from one point to another has to be done by winding the film back and forth between two rolls, and when a roll has been read through, it must of course be entirely re-wound or the next user will find it back to front.

A variant form that became widely used on the Continent, but is almost unknown elsewhere, was the short filmstrip of some six inches long by 35 mm. wide. These filmstrips were at first used for brief documents such as periodical articles, but soon came also to be used more widely, and a long document was copied on to several strips which were then attached to a kind of wallet to keep them all together and give some degree of protection. The strip was named 'microfiche', but it has now been supplanted by a form five by three inches or five by four inches (international standards for index cards), which contain some 40 pages and give the title of the documents in a readable size along the top. This microfiche was developed by L. J. van der Wolk, of the Technological University of Delft, and has become increasingly popular since it received its first real publicity in about 1950. Each microfiche is kept in a little white envelope (with no flap) cut away to a depth of half an inch along the front, so that the title can be read without removing the fiche. The advantages include ease of storage, since the fiche can be filed in standard library catalogue drawers, and low costs; it is almost as cheap as roll film for producing single copies. It is much more convenient to use than roll film, and no re-winding is necessary.

Perhaps the simplest and yet the most striking form of microcopying so far is the Microcard, which, as its name implies, is a microtext printed on opaque white card instead of on transparent film. The Microcard was invented by Fremont Rider, of Wesleyan University, Connecticut, and won immediate approval. Rider established the non-

profit-making Microcard Foundation to promote the use of microcard, not so much for making single copies (for which it is expensive), but for actually publishing in very small numbers, and several scholarly publications and serials with a limited appeal are now available on microcard. It offers a cheap, convenient, and durable medium for such material, and might well be considered for application to theses. Indeed, some theses in the U.S.A. and in Great Britain are already being produced in this form and it is to be hoped that the practice will spread, to THE YEAR BOOK OF EDUCATION for example. A recent development is the double-sided microcard which, in addition to containing twice as much text, overcomes the irritating tendency of the one-sided card to curl forward.

Another recent development that increases the flexibility of the microtext is the microtape. The text is reproduced on opaque white card in a strip about half an inch wide, and wound in a roll on a spool, like roll film. The tape has an adhesive back to which is lightly attached a crinkled plastic strip. This strip can be pulled off and the tape stuck on a sheet of card or paper of any size desired by the user. In this way, for example, a thesis contained on six one-sided microcards can be attached to one side of a single sheet of foolscap; obviously an extremely simple means of collecting together on one sheet a number of short documents dealing with the same subject.

No doubt each of these forms has a part to play in copying and in saving storage space. Their use depends as much on the machines needed to read them as on their own qualities, and here there have been great advances in recent years. The early 'readers' (an unfortunate term, since readers are obviously *people* who read) were cumbersome affairs needing darkened rooms, and not unnaturally aroused some considerable resistance among those who had to use them. It is not surprising that microfilms made slow progress. The latest readers, however, are much more satisfactory, and many models are now available in various countries. I might perhaps mention the small Dagmar, originally built at Delft for reading film and fiche, but which is now fitted with a simple adaptor which enables it to read microcard; it is now one of the cheapest all-purpose readers and weighs less than a portable typewriter. In addition, the makers offer a special price to students and individual research workers; and this concession, combined with the cheapness and easy storage of microfiche and microcard, may yet help to bring back the day when a research worker owns an extensive library—a micro library of which large sections can be carried in the pocket.

Full-size copying of documents has been well-known for so long that it needs no description here apart from one exceptional development

and librarianship in a small school, it simply will not do in a university institution. This is not by any means to deprecate the work that has been done in colleges with a combined post; but such arrangements must necessarily be compromises, and library developments have now reached a stage beyond compromise. The importance of library tutorial work, as against subject teaching, is that it must actually be done in the library and not away in some classroom. With the introduction of longer courses, like the three-year course in Great Britain, it will be more than ever desirable that college libraries should provide the resources necessary for students to derive the maximum profit from their new opportunities. In particular there will be a need to improve the resources for research, because one of the objectives of the longer courses will be to encourage the students to carry out original work of their own.

Some of the most interesting library services established since the war are those of government departments and Institutes of Education, and a number of these have been described in the *Education Libraries Bulletin*. We have so far had articles on the British University Institutes of Education, the New Zealand Department of Education, The Institute of Pedagogics at Jyväskylä, Finland, the UNESCO Education Clearing House, and the New York Institute of International Education. We hope that issues in the near future will deal with institutes in Bulgaria, Yugoslavia, and Poland, and with the I.B.E. library in Geneva.

Extensive co-operation is growing among these Institutes. Many of those which find difficulty in obtaining currency for foreign books are able to offer the educational publications of their own countries for exchange and, similarly, many societies with limited budgets are able to build up respectable collections by using their own journal in this way. The London Institute receives more than fifty journals by exchange, and clearly this arrangement has particular significance for the study of comparative education.

An advantage enjoyed more by institutes in the U.S.S.R. and the countries of Eastern Europe is the extensive use of legal deposit. This means that in addition to the copies of new books normally deposited in national libraries as evidence of the author's copyright, copies are also supplied to the institutes that are the national centres for the study of the subjects. In this way, the central education institute receives a copy of all the educational books and journals published in a particular country, and often has attached to it a centre for compiling the current national bibliography of the subject—books, pamphlets, and articles. Thus the state provides in these countries the sort of service given by the American H. W. Wilson Co., with *Education Index*.

Great Britain enjoys neither of these two forms of bibliographical organization, but for the last few years there has been compiled an *Index to British Educational Periodicals* by the co-operative efforts of the librarians of the University Institutes of Education. This has been published quarterly in mimeographed form, with author and subject sections. Originally distributed only to Institute Libraries, it has latterly been offered for sale to a rather limited public. However, a cumulation of the issues for 1954-8 has been compiled for publication by the Library Association in a single volume, which will make the British periodical literature very easily accessible for the first time. It is hoped that further cumulations will also be published at appropriate intervals.

Thus it can be seen that many very interesting new ideas and techniques are now agitating the library profession. Their impact has naturally been greater in some fields than in others, and I hope that the impression left by this survey will be that further development along some of these lines would bring considerable benefits to education. Like teachers, librarians aim at assisting the progress of knowledge in every field; basically, our role should be an educative one. In the subject of education itself, therefore, we have the highest possible incentive to provide services that keep pace with and indeed anticipate the requirements of our readers. Given the opportunity, we shall take it.

D. J. FOSKETT.

The Use of the Tape Recorder in the U.K.

In the past few years the tape recorder has been firmly consolidating its position as an educational aid of the highest value. Interest in the use of this instrument has been growing, and a keen understanding of its purpose and of its usefulness has been maturing. In England and Wales there is scarcely a type of educational institution in which the tape recorder has failed to prove its great value and stimulating interest to teachers and lecturers, as well as to pupils and students.

A feature of recent developments has been an easing of the legal difficulties faced by teachers wishing to make tape recordings of programmes transmitted by the Schools Broadcasting Council. In many cases teachers record programmes for subsequent use in their schools, and thus overcome difficulties of broadcast—and school—timetables.

Use in Schools

To some extent the way in which a tape recorder is acquired for school use conditions the manner in which it is used in school. Sometimes teachers are using instruments which they have themselves bought and have generously introduced into their classroom techniques. In other schools the instrument has been acquired as a part of school equipment. In others, again, the tape recorder has been purchased as the result of a special fund-raising effort.

Teachers in some cases control the use of the machine themselves, while in other situations teachers have found it of great value to let children record material by themselves. A decision of this kind depends to some extent on the ease or difficulty of control of the instrument. Push-button controls tend to be the easiest for children to manipulate. A revolution counter is also of further help to both children and teachers when recording.

The preparation of tapes for use in the classroom has been a feature of the use of the tape recorder by some teachers. In some cases, tapes of this kind have been prepared by English teachers for an international competition in the use of tape recordings in school. At least one of our junior schools has won a very high international award in this field. Occasionally, the preparation of tapes by children is one of the final stages in the completion of a project, centre of interest, or activity spread over several weeks. In this way junior school children have pro-

duced quite significant tapes on 'Elizabethan England', 'Victorian Housing', and a variety of interesting topics.

In scripting and editing tapes of this sort teachers and children have discovered by practice some of the principles of 'mixing' sounds. The human voice, real noises, studio or classroom noises, and musical accompaniment have all been found blended into a sound track. Considerable ingenuity has been shown in tackling the acoustic problem of recording in school classrooms, staff rooms, and halls. Enthusiasts have even experimented with multi-microphone leads and with damping materials to destroy echo. Scissors and thin transparent adhesive tapes have greatly helped editing and selection as well as making correction or 'dubbing' a possibility. Practical work of this kind has also helped very considerably in developing an understanding of the background of noise in the ordinary social exchange of the classroom.

One of the first educational uses of the tape recorder, and one which persists in popularity in schools and colleges, is that of recording some significant occasion in the life of the community. School speech days, when a distinguished visitor presents the prizes for the year and addresses the whole school, are frequently occasions on which the school choir and orchestra give special performances. In some schools it has become the habit to record the whole proceedings and then subsequently to edit the tape. By this means significant achievements are available for comparison and to encourage emulation by succeeding groups. In one sense the tape recorder is here assisting the establishment and development of tradition in a school.

In some of our colleges, royal visitors and distinguished scholars have participated in important anniversary functions. Their speeches have been recorded and treasured in the archives of the college. In this context it seems that the store of significant tapes is a most valuable alternative to printed texts on the library shelves.

The references already made to musical items recorded on speech days indicate one of the subjects in the curriculum in which great progress has been made in the use of the tape recorder. There have been prepared some quite magnificent tapes of school recorder orchestras, of school choirs, and indeed of school orchestras. It is in the course of development towards the preparation of the final recording, or indeed in normal teaching of music without the idea of a final concert in mind, that the tape recorder is extremely valuable. It is possible to demonstrate in incontrovertible fashion exactly what a choir or orchestra has done with a particular phrase or sentence. It is extremely valuable for the teacher or conductor to use aural evidence of this kind to demonstrate exactly what has to be improved. With selected students, although this is indeed of value to all students of singing, it is also

advantageous to confront them with what they have just produced; selection of singers for this kind of frontal treatment should have some regard to their psychological reactions, which, in most cases, depend almost entirely on their stage of development as singers.

Use in Teacher Training

This is making use of the accuracy of reproduction of the tape recorder. This same quality is of great value in the teaching of foreign languages, in the teaching of English as a foreign language, and in the general teaching of speech. For this reason the tape recorder is proving of great help in secondary education and in specialist schools of language as well as in the wide range of institutions, including schools, where quality of spoken English is being sought. It is frequently possible to have the voices of native speakers of the foreign languages on tape, and this provides a welcome aid in affording examples of vocalic values, rhythms, stress, and intonation. It is possible to aim at an individual recording for each child or student, but it has been found to be an educationally desirable half-way house to have controlled recordings of groups of six or so reading or simply talking together. This kind of development has gone so far in one teachers' training college for every student to have a *disc* record of his voice made at regular intervals throughout his course, the earlier discs being available for personal comparisons.

One important development involving the use of good speech on the tape and also the compilation of a script by pupils and teachers is the exchange of tapes with schools in other countries. Even small, remote, rural schools in England have prepared tapes of local interest for this 'export' exchange, and have received in return documentary tapes about life in other countries both within the British Commonwealth, where normally there are no language difficulties, but also about life and customs in other lands where frequently the recipients are delighted with the quality of spoken English. This is proving at once a means of discovering the 'story' of our own environment and a positive fillip to the development of international understanding. It is therefore linking local studies with world studies and is one of the most attractive methods of doing so.

A subsidiary product of the use of the tape recorder is the growth of a special interest in voice and speech on the part of teachers. This has very provocative results in the classroom, and may also be claimed to have encouraged in some teachers a fresh understanding of the nature of the problems of communication arising from the use of the mother tongue. An extension of this process is seen in the use of the tape recorder in at least one training college. Here, selected students on

school practice are asked to collaborate by having a live microphone in the classroom during a lesson for which they are responsible. The tape is then available for analysis by the student, the college supervisor, and if it is deemed desirable, by others learning the job of class teaching. While nothing may adequately replace the visit of a supervisor to the practising student, the use of the tape certainly avoids the distraction caused by the introduction of another personality into the classroom situation. The microphone may be reasonably concealed so that pupils are not affected by it; indeed, one of the remarkable facts about the developments in the use of tape recorders in schools is that pupils quite soon appear to reveal a complete absence of positive awareness about the microphone.

While tradition is helped by recordings and the quality of speech in mother tongue or foreign language, and of music by voice or instrument is improved by the wise use of tape recorders, perhaps the greatest progress that has been currently achieved is in the development of an aesthetic appreciation of the quality of recorded sound and language. The discovery by children of the exacting demands made on them in the preparation of their tapes is of the highest educational value. That even quite young children learn to use words exactly, to present succinct but clear word-pictures, and to manipulate analogies in order to produce an attractive tape to play to others is a demonstration of the quality of expression revealed by using recording techniques. Their fluency is not achieved simply by scissors and adhesives; it becomes a harnessed mode of expression where sheer economy teaches that words count.

This quality of language experience is closely allied to the high measure of appreciation of the creative skill which the group enjoys on the successful presentation of a completed tape to the whole class. This is a real test of 'composition', and in its own way a demonstration of one of the modern developments in communication.

D. J. JOHNSTON.

CHAPTER FIVE

The Synchroreader

It became known in 1957 that for the previous two years Professor Hoshino, of the Tokyo Institute of Technology, had been at work, with the help of the research staff of the TDK Electronics Company, on an invention which, if even half what we are told about it is true, is a big advance on the tape recorder. The apparatus (known as the synchro-reader) which has emerged from Professor Hoshino's experiments is not at the moment of writing on sale outside Japan, nor is it clear to what extent it has been marketed there or to what use purchasers have put it. According to the London *Daily Telegraph* of April 20th, 1959, however, a 'talking magazine' had been on sale in Tokyo the previous day. This was the monthly *Asahi Science*, one page of which carried photographs of Niagara Falls, Big Ben, and the Houses of Parliament, backed by a printed recording. Readers were invited to detach this special page and to call at one of the magazine's offices to get the sound of the Falls and of Big Ben played back. Shortly afterwards, the *Asahi Shimbun* published a *spoken* commentary on the Japanese Crown Prince's wedding, and the music played at the ceremony, both on the back of a news photograph. According to the Tokyo correspondent of *The Times*, the quality of sound produced was not quite as good as that of a tape recording; but a company in Tokyo was already producing 3,000 models a month.

Details of Operation

The synchroreader is the piece of apparatus on which synchrosheets are played. Smaller than the average television set and somewhat larger than an office typewriter, it is electrically operated, and the number of controls is small. Essentially it is a box which contains recording and playback facilities, and on top of which there is a frame in which synchrosheets can be fixed, either singly or in number. There is a built-in microphone at the front and a loudspeaker at the back. The sheets can be turned, if necessary, like the pages of a book. A line indicator shows which line of the text is being played. Volume and tone can be modified, and the recordings can be replayed from any point, quickly findable by means of an indicator. At present the apparatus costs about £200,¹ and this includes accessories.

¹ £1 = \$2.80.

The synchrosheet, which uses paper as its base, has text or illustrations on one side and a magnetic coating, cheaply produced, on the other. Recordings (five or ten minutes in length, according to the speed chosen) are made on the synchroreader, the recording heads moving in a circular motion down the underside of the sheet as it lies in the frame. A large number of copies can speedily and automatically be made from this original. Synchrosheets, it is claimed, can be folded and even crushed without damaging the recording. Erasures can be made, as from magnetic tape, and the recordings are said to be playable 2,000 times without noticeable deterioration. The sheets can also be bound together into a 'talking book', the pages of which the synchroreader will deal with in turn. Unlike tape, they cannot, however, be edited by cutting.

Advantages

Thus the synchroreader offers a combination of advantages which no existing audio-visual aid can claim to possess.

First, the auditory and the visual image are synchronized; in particular the images of letters, words, and sentences with their sounds. There is also the association of pictures with the sounds of their content (the volcano may be heard to erupt, the grass to rustle, the tennis ball to rebound); but this association is offered by the film and television in *moving* pictures, where it is truly a synchronization. With the synchroreader, however, the association may be recalled repeatedly and at will by the individual handling the apparatus. It is true that the sound-track of a film may be recorded, but some trouble is involved in arranging this and the sequence of pictures cannot so readily be recalled. The visual element of a television broadcast cannot often be recovered. The synchroreader scores points against these two predecessors, as they against it; but by synchronizing *print* and sound for the private user, it marks a new and desirable achievement.

Secondly, the synchrosheets are much cheaper than magnetic tape. In due course the apparatus itself should be markedly cheaper; it is still, since it is not yet widely in use, at a somewhat experimental stage—or at least we must hope so.

Thirdly, the synchrosheets are easier and cheaper than tape to carry about and to send through the post. They can be mailed (at least within a single country—customs regulations have to be faced if there is to be international transmission) in an ordinary envelope. Tape needs much more packing and costs much more in stamps; moreover, it is a great deal more conspicuous.

Fourthly, synchrosheets are almost as convenient to file as papers, since they cannot easily be damaged and they take up little room.

Fifthly, copies of synchrosheet recordings can be made a great deal more quickly and cheaply than copies of tape recordings.

Lastly, a long period of playback may be had by fastening together a series of such sheets.

Implications for Teachers

The apparatus has a strong claim, it is evident, on the attention of teachers and other educationists. Like the tape recorder, it is an invention with which ready-made material can be used but for which the teacher may also make his own material; it can be used at any time, unlike a radio lesson (unless recorded); it is handier than film; it can add spoken print to print; unlike the television set, it makes its own library; and just as pictures illustrate text, so the synchrosheet can illustrate both with a variety of sounds. These are its advantages for the classroom. Its main disadvantage there, at present, is that because of its size only a small group can at one time gather round it. However, a public synchroreader using larger sheets is, we are told, being developed.

That the synchroreader, or something of the kind, will soon be found essential in the worlds of business and entertainment is reasonably certain. We may expect the prototypes to be developed in various parts of the world with the needs of both very much in mind. Education should put in a claim to influence development by experimenting with the practical use of the invention. Clearly, it has possibilities in the field of instruction. Wherever it is important to link visual and auditory perception closely together, something like the synchroreader will come into its own. For the teaching of music and languages entire audible textbooks will need to be composed; not only will trumpets sound, but the pictures of trumpets also—crotchets and quavers will come to life. Not least important here is the study of detail through repetition. Nature study and biology, too, will benefit; the image of the lion will be made to roar, the cricket in the top right-hand corner of the textbook will chirp divinely if treated in the right manner. Geography lessons, too, will be more interesting and effective when the *muezzin* may be heard as the photograph of a mosque is studied; the jungle, the market place, children of other countries—such things call out to be seen and heard simultaneously. And soon the day will be here when the young citizen detaches the photograph of Eisenhower or Khrushchev from his world-citizenship reader, places it on the synchroframe, and listens to the famous phrases as they were really spoken. The British Institute of Recorded Sound, so far virtually a one-man show, will doubtless be equipped with a large staff, occupied during school holidays in playing over on a public synchroreader the

audio-visual texts chosen from the sight-sound library by boys and girls once content with silent stuffed birds and wax figures contemplating each other dumbly; or these birds and figures themselves will be equipped with an appropriate sound accompaniment.

Joking apart, a great deal is in prospect if only the invention can be exploited with enterprise and imagination, if enough money is available to turn it to educational use, and if its development is not hamstrung by too many patents and other restrictions. Not the least revolutionary of its possible effects would be the establishment of spoken correspondence between teachers and groups of students; tape is rather cumbersome for the purpose. Contact between scattered enclaves of learners would become more effective. Discussion of all kinds between people who cannot often meet—for instance, between doctors or teachers dispersed over a wide area—will be facilitated. Oral examinations by post should become easier to conduct, and centralized control of the examining easier to impose. There will doubtless be more private and semi-private recording of broadcast programmes, as this will be an inexpensive process and the material is to hand. Classrooms and museums alike ought to be livelier places.

Wordsworth wrote in 1798:

Books! 'tis a dull and endless strife:
Come, hear the woodland linnet,
How sweet his music!

We shall only have to turn the page.

W. R. LEE.

Closed Circuit Television for Science—U.S.A.

THE application of science and the scientific method is playing an ever-increasing part in to-day's world, influencing not only the daily living of the individual but extending to the world-wide struggle among nations. Both general and technical knowledge are increasing rapidly as a result of widespread scientific investigation and research.

Rapid change and development not only make urgent the need for up-to-date information, but also make possible the use of resources that differ greatly from those generally used as a part of formal education. Learning is not a one-process procedure. We know that people learn in many ways. Teachers should, therefore, use every method and technique at their disposal to help students learn, accept responsibility, and apply the knowledge that has been acquired.

Television is one of the resources that is a product of our scientific and technological knowledge. In a relatively few years commercial telecasting has been accepted and has become an important part of family life. Evidence from home viewing indicates that it is a powerful means of communication which is having a tremendous impact. It is obvious that people are learning from television viewing. All members of the family can benefit from having accurate pictorial descriptions of people, places, events, and processes. Young children who have not yet learned to read are able to recognize many words on the screen and associate them with objects, products, and people. Their curiosity is aroused and they ask many questions.

It was only natural that educators would become aware of the potentials of television for instructional purposes. As a result, a number of school systems and colleges began experimenting with this new medium to answer such questions as—"Does television make an effective contribution to the school system? Can it improve the quality of the instructional programme? Can it help solve some of the pressing problems facing education to-day?"

The first use of television in schools was the occasional viewing of commercial programmes related to topics studied in the classroom. Soon, however, special educational television stations (ETV) were established and began to supply programmes for adult education and local school systems. These 'open-circuit' attempts were followed by 'closed-circuit' experiments on a small scale. While the results of

using 'closed' or 'open' circuit are similar, the methods of transmission differ. In an open-circuit, the signals are broadcast through the air. In a closed-circuit they are carried to the receiving sets by means of a cable. Sets must be connected to the cable in order to receive the telecasts. Both methods have advantages and disadvantages. An open-circuit station can transmit on only one channel. A closed-circuit, on the other hand, makes possible the simultaneous transmission of many channels over the cable. This provides flexibility in scheduling that is of great advantage to a school system. Closed-circuit also utilizes less complicated and less expensive equipment; however, the cost of cable installation or rental could change the cost factors in systems where distances between schools are great.

To-day, more than 560 school districts and 117 colleges and universities in the United States are using television for instructional purposes. This use is not casual or superficial, but is providing carefully planned educational experiences that are part of the total curriculum.

Improving the Quality of Instruction

The Washington County Closed-Circuit Educational Television Project is an example of how television is being used by a school system in the United States to improve the quality of instruction. This five-year project has now completed three years of operation. Here, television is used to motivate, stimulate, inform, demonstrate, develop ideas, show applications, enrich backgrounds, raise questions, provide common experiences, suggest activities, and challenge pupils to assume more responsibility for their own study. Other aspects of the lessons are carried on by classroom teachers, who provide for class discussion, direct and supervise the activities growing out of the lesson, and help pupils apply what has been learned.

The total course offerings in grades one through twelve include arithmetic, general mathematics, geometry, languages, arts, science, social studies, United States history, music, art, remedial reading, and advanced mathematics. In addition, television has been used for occasional supplemental work in many subjects, for assistance in course selection, and for special community events which are of interest and value to the students. Although the overall programme is broad, the daily television experience of any one pupil has been limited to only a few televised subjects. The closed-circuit system provides six separate channels for simultaneous transmission. Thirty-seven of the forty-nine schools in an area of 487 square miles are now connected to the closed-circuit. Eventually, all the schools of the system will be in the circuit and approximately 19,000 pupils will be involved.

Science is one of the important areas included in the Washington

County Television Project. The science programme includes regularly scheduled television lessons for sixth-, seventh-, eighth- and ninth-grade pupils and enrichment lessons for grades one, two, and three. Science by television has been enthusiastically accepted by the students. It is the favourite subject of sixth graders, as was indicated in a survey (May, 1959). A majority of the students indicated that they liked televised science. Approximately three out of four (71.8 per cent) indicated that they preferred to have their science class "with television" instead of "without television". (Other choices were 10.4 per cent "without television"; 17.7 per cent "makes no difference".) In response to, "Do you think that you can learn more about science with television or without television?" approximately three out of four, 77.2 per cent, selected "learn more with television"; 12.4 per cent "learn more without television"; and 10.3 per cent "makes no difference".

Students were asked if they had read voluntarily as a result of science telecasts. They reported a variety of reading material, including books, magazines, and newspaper articles.

Teachers expressed the opinion that students could learn more from televised science than from their own teaching in the classroom. In answer to "Do you think that your pupils can learn more about science with television or without television (with you teaching the class)?" 92 per cent said "with television", 4 per cent "without television", and 4 per cent "makes no difference".

Teachers stated that they thought the lessons were more stimulating when taught by television than when taught in the classroom. This proved true when the child's after-school activities were analysed. Twenty per cent of the one hundred and five sixth graders questioned at one school reported that members of their families participated in after-school science projects with them. One student wrote: "My mother and father helped me locate constellations in the sky." Another boy volunteered: "After school when I go home I usually discuss the science telecast with my mother. When my father comes home, we all talk about it at the supper table."

Many of the students were motivated to try simple science experiments at home that were an outgrowth of televised instruction. Many conducted experiments demonstrating the application of gravity and surface tension and the properties of various elements and compounds, such as iron and carbon dioxide. Others worked on a variety of projects which included wet and dry bulb thermometers to measure humidity, anemometers, weather vanes, and numerous objects to demonstrate kinetic energy.

Students from many schools visited the television studios to exhibit

their rock and shell collections, telescopes, and pets to other students viewing the telecasts in their classrooms. One student even built a volcano and demonstrated an eruption.

The Special Suitability of Science for Television

The reasons for the acceptance of science as a televised subject are not hard to find. Science seems especially suitable for television. This medium gives schools an opportunity to do some desirable things which otherwise are not possible or feasible, or which can be handled more easily and effectively.

A television teacher can have a great variety of high quality specimens, resourceful people and visuals at his disposal that are unavailable to the classroom teacher. Lessons can be planned to utilize this effect.

Television draws on reserves of able people from the community, state, and nation. These persons can be made available to all pupils in the system. Some specialists who have appeared on science telecasts in Washington County are: a group of airmen from the Andrews Air Force Base, who exhibited and explained a space suit and survival equipment; a herpetologist, who taught a lesson about poisonous snakes; a fish culturist, who demonstrated the milking of fish for breeding purposes; an apiarist, who exhibited a bee-hive and presented a lesson on bees; and a florist, who taught an elementary botany lesson and demonstrated how to arrange flowers and/or weeds in interesting displays.

The actions and drama of community and world happenings which show the applications and influence of science can be brought into the classroom as the events are taking place. This permits the school to capitalize on immediacy and gives viewers a feeling of actually being present at the scene of the action.

The television camera can peer into places that are usually inaccessible. It can go into factories, inspect the dials of remote instruments, even look into furnaces and immediately bring enlarged views to the pupils in the classroom.

Teaching equipment and materials can be used for the benefit of larger numbers of pupils. Television encourages broader use of existing audio-visual aids such as projection, materials, models, mock-ups, and tape recordings.

The television camera can greatly magnify a small part of the area to be shown. This is most effective when presenting a close-up of a demonstration. The pupil can often see what is happening more clearly than if he were present at the actual demonstration. Every seat in the classroom thus becomes a 'front-row seat'. This was demonstrated when a science teacher dissected the eyeball of a calf for a telecast.

One student commented, "I could see everything. I never saw anything like that before." The camera was able to magnify microscopic bits of tissue so that hundreds of pupils saw this enlargement in great detail.

Activities, too dangerous to be handled in a classroom situation, may be presented under controlled conditions. Experiments in which gases, liquids, and solids are exploded to show dangers of great power in small spaces could not be conducted in classrooms; neither would it be safe to shoot off rockets or to handle poisonous snakes.

The television screen gives the teacher an effective means of directing and controlling the attention of pupils. It provides a special, central point of concentration for group instruction. It implements the development of good habits of sustained attention, careful observation, and attentive listening which contribute to the development of the scientific attitude.

These advantages lead to greater learning. This was demonstrated by a study made of sixth-grade test results. The Stanford Achievement Test (Intermediate and Advanced Science Test) was given in September, 1957, and again in May, 1958. Approximately nine hundred pupils in the sixth grade who received television lessons in science achieved fourteen months' growth. The remaining six hundred pupils who had conventional classroom instruction in science achieved ten months'. A difference in achievement was also found among varying ability levels. For above-average I.Q. pupils, those who received television instruction achieved three months more than those in conventional classrooms; average ability television pupils realized three months more growth; the below-average-ability pupils, who received science instruction by television, achieved seven months more than those in conventional classrooms. Incomplete records for the current school year indicate a much greater growth for the pupils in the televised science course than in the previous year. For example, the average score of the pupils in a large elementary school in the sixth grade in September, 1958, was 5.2. In May, 1959, it was 7.5, or a growth of two years and three months.

The pupils were subdivided in two ways; ability and achievement in science at the beginning of the year. The table presents the average growth by three levels of ability irrespective of initial achievement. Each cell portrays the number of pupils, their average intelligence quotient, and average growth from September 1957 to May 1958 on alternate forms of the Stanford Science Test.

Instructional television procedures make possible the provision of more time for teacher planning, emphasizing the importance of content selection, organization, and the utilization of visuals to bring meaning to abstract ideas. As one teacher said, "There is no other situation

TABLE OF AVERAGE GROWTH IN SCIENCE IN GRADE SIX
BY THREE ABILITY LEVELS

<i>Ability Levels</i>	<i>Pupils Receiving Televised Lessons</i>	<i>Pupils in Conventional Classrooms</i>
111-140	201 pupils 118 average I.Q. 15 months average growth	84 pupils 117 average I.Q. 12 months average growth
90-110	527 pupils 100 average I.Q. 14 months average growth	365 pupils 100 average I.Q. 11 months average growth
57-89	155 pupils 83 average I.Q. 13 months average growth	146 pupils 83 average I.Q. 6 months average growth

where the teacher has so much time to plan lessons and create visuals for the lesson. This is the most satisfying part of teaching on television."

The television lessons in science also provided an effective means of in-service education. Most teachers have never had the opportunity to see their associates teach a lesson. Even the best teacher can profit from observing another's methods and procedures. Television makes this an everyday possibility. The telecasts also provide a common background for working together in curriculum planning and development.

Television is different from other aids to education that have emerged over the years. A lesson does not automatically become better, more forceful, or challenging because it is taught by television. A television lesson is not just a passive experience for pupils. It should be one in which a variety of procedures are utilized to transform 'seeing and hearing' to 'active participation'. Televised lessons reflect the ideas and procedures considered important, useful, and appropriate in a school system. The effectiveness of television, the role it will ultimately attain, and its impact upon instructional practices and concepts will depend on how intelligently and imaginatively it is used.

WILLIAM M. BRISH.

CHAPTER SEVEN

American Midwest Council on Airborne Television Instruction

A NEW advance in educational television had its origin in the United States last year. Prominent educators, business companies, and foundations have joined forces to establish a Midwest Council on Airborne Television Instruction. The purpose of the Council is to establish and maintain a flying educational television relay centre to serve schools in the Midwestern region, especially small schools, normally beyond reach of the ground operated educational television stations. The following discussion and description of the project was written for the various press releases by John L. Perry and edited for publication in THE YEAR BOOK OF EDUCATION with his permission and that of the Council.

The Educational Need

The American schools and colleges face the dual challenge in the coming ten years of educating far more students and giving each student a much better quality education than ever before.

Educational expenditures will have to increase, but it will take more than money to solve the problems posed by this challenge. It will require far-reaching innovations that will increase instructional efficiency and strengthen the curriculum.

Only a fundamental breakthrough in education, as sweeping as past breakthroughs in science, industry, and agriculture, can provide the boost in educational quality that is needed, all across the curriculum and all across the country.

Television represents a powerful new tool which can help bring about this breakthrough. Like movable type and the printed page, however, television is simply a medium of communication, though the most powerful one known to man. Its utility to education will depend primarily on how wisely it is used, on the quality of what is communicated, and on how television instruction is integrated with other learning experiences in the school.

The Midwest Airborne Television Instruction Experiment represents a promising opportunity to harness television to bring the highest quality of education to millions of youngsters, in large and small communities alike, more quickly and at less cost than by any other means available.

The expanded use of instructional television is seriously inhibited by major obstacles. First is the limitation of geographic coverage of existing educational television stations. A large majority of school children, particularly in small towns and rural areas where educational help is needed most, are beyond the reach of these E.T.V. stations.

The second obstacle is that single open-circuit channel, even when available, cannot serve a very significant portion of the whole curriculum or grade spectrum. A typical 12-grade school system has anywhere from 100 to 175 separate courses, and some of these may be divided into differentiated sections according to student ability. A single television channel can provide only 12 half-hour units of instruction, however, in a six-hour school day, enough for only 1 half-hour per day at each grade level. The disparity between broadcasting potential and size of curriculum is even greater at the college level.

This limitation can be overcome by a closed-circuit system with six simultaneous channels, but here the third obstacle is encountered: the cost is prohibitive when the students to be served are in classrooms which are geographically dispersed.

The contribution of instructional television to improving the quality of American education will be severely restricted unless these obstacles are overcome.

The system of multi-channel airborne instructional television proposed in the Midwest Airborne Television Instruction Experiment holds promise of achieving this.

The Present Status of Instructional Television

The effectiveness of television as a powerful medium of school and college instruction has now been clearly established, though much remains to be learned about the best and fullest ways of employing this new educational tool.

In the 1958-9 school year, 569 public-school systems and 117 colleges and universities in America used television for direct instruction in regular courses involving more than 500,000 school children and 100,000 college students.

Despite the primitive technical conditions and other handicaps under which these early instructional television experiments have operated, the results have been very promising. In the majority of cases, there has been no significant difference in how much students learned by television and how much they learned by conventional instruction. Where there have been significant differences, however, they have favoured television instruction overwhelmingly.

It has now been demonstrated that television is an effective means

for giving far more students access to rare and unusual teachers, for giving students good learning experiences, such as scientific demonstrations, that cannot possibly be provided in ordinary classrooms, and for improving the skills and knowledge of classroom teachers themselves.

The Feasibility of Airborne Educational Television

In a three-year experiment soon after the Second World War, the Westinghouse Electric Corporation developed and demonstrated the technical feasibility of airborne television broadcasting by delivering a satisfactory signal from an airborne transmitter operating at 25,000 feet to receiving sets as far away as 225 miles, where terrain conditions were favourable.

'Stratovision'—the technique of re-broadcasting T.V. signals from a high-flying aircraft—was originated in late 1944 by Charles E. Nobles, engineer of the Westinghouse Baltimore division. Mr. Nobles headed the company's experimental programme, which included equipping a modified B-29 with television transmitters and carrying out a series of test telecasts from 1945 to 1948 which delivered a satisfactory picture to receiving sets as far away as 225 miles in all directions. It was a second Westinghouse electronics engineer, Reuben Lee, also of the company's Baltimore division, who suggested that Stratovision be adapted at this time to help provide the 'breakthrough' in educational television.

Recent engineering studies, drawing upon the technical findings of the Westinghouse Stratovision experiment, indicate that it should be possible to broadcast over six channels simultaneously from a DC-6. Such a system could handle live or video-taped and filmed broadcasts by a first-class faculty from ground studios underneath the plane and distribute these programmes to schools or colleges over much of the territory within a radius of some 200 miles. A second stand-by aircraft would insure high reliability of operating against weather conditions and equipment breakdown.

If such a T.V. broadcasting system can be perfected, it will make available, at relatively low cost, a top faculty and a broad and rich curriculum to a very large number of students, both in small rural schools and in large urban schools. For example, within a radius of 200 miles of north-central Indiana there are more than 5,000,000 students in over 13,000 separate schools and colleges. About one-third of these are in school systems of fewer than 2,000 pupils which, according to Dr. James Conant's recent study of the American high school, are too small to provide a satisfactory education under present conditions.

All of these schools and children could be served by a single aircraft, except where terrain and similar obstacles caused reception 'blind-spots', especially on the outer edges of the circle.

The proposed system could operate effectively on U.H.F. channels. A substantial number of these are now unused and are available for educational purposes.

New Techniques to Conserve Broadcasting Channels

There are sufficient idle channels in the selected pilot area to permit a full-scale experiment, but application of airborne instructional television to all areas of the country would require a very large number of U.H.F. channels in order to avoid interference between adjacent broadcast areas. It has, therefore, seemed prudent to explore the feasibility of new broadcasting techniques which would conserve channel space.

The techniques used to-day for both open-circuit and closed-circuit T.V., including the width of the broadcasting band, were established many years ago. More recent technical developments, at C.B.S. Laboratories, have demonstrated the possibility of broadcasting a good quality video image within a 3 megacycle band width instead of the conventional 6 megacycle band.

A laboratory-scale test of 'narrow-band' broadcasting was successfully conducted on June 15th, 1959, at C.B.S. Laboratories in Stamford, Connecticut, with the co-operation of Westinghouse. A jury of educators who witnessed the demonstration concluded unanimously that the narrow-band system was at least as effective in communicating educational information as the conventional system, and in some respects even more satisfactory.

If narrow-band T.V. broadcasting can be successfully applied to multi-channel airborne broadcasting for educational purposes, it will mean a 50 per cent economy in required channel space. It can also lead to tremendous economies in video tape, which is certain to become of great importance to education in the future.

The integration of the new narrow-band technique with airborne educational broadcasting presents very promising possibilities. Its one important limitation, at least in the present state of technology, is that the narrow-band signal cannot be satisfactorily received on conventional home sets, thus confining reception to schools and colleges equipped with new-type receivers.

The airborne narrow-band system, however, would not interfere with conventional home broadcasting by commercial or other stations. On the contrary, regular educational T.V. stations could become programme producing centres for the airborne system, and they could

'capture' airborne programmes on video tape for later re-broadcast to local audiences, in both schools and homes, by conventional means.

The Potential for Improving Education

Quality of Instruction.—The shortage of top-quality teachers will be the greatest obstacle to the improvement of American education over the next ten years, even assuming a sizeable increase in teachers' salaries.

T.V. has already been demonstrated to be an effective means for extending the reach of rare and unusual teachers to a far larger number of students. It has also proved to be a powerful tool for the in-service improvement of regular classroom teachers, for providing special opportunities for gifted children, for improving the design and content of the curriculum, and for supplying rich learning experiences that would be physically impossible in the conventional classroom.

It would be foolish to use airborne television for anything but the highest possible quality of instruction and curriculum. Therefore, only the finest available teachers will serve on airborne television. A staff of researchers and artists will be available to assemble or prepare special materials for individual faculty members. The richest sources of scholarship will be accessible.

In short, airborne television will be used to make available even for the smallest rural school, the finest curriculum and quality of instruction that the American nation can provide.

The pilot experiment will begin initially with the telecasting of two separate sets of instructional programmes over two conventional UHF channels (two narrow-band channels will be used at the same time). If this pilot operation proves successful, then it would be possible to expand the service to six simultaneous programmes.

An airborne T.V. system transmitting six simultaneous programmes could provide 72 separate half-hour units during a six-hour school day. This would make it possible to provide high-quality televised programmes covering a considerable portion of the entire curriculum of a school system at all grade levels, even allowing for some repetition of programmes at different hours to provide greater flexibility of scheduling for individual schools.

In addition, it would be possible to broadcast special programmes before and after the regular school day, such as 'advanced standing courses' for bright high school students and improvement courses for teachers.

Curriculum Flexibility.—There is no doubt that excellent courses presented over television will make a marked and prompt contribution toward lifting the standards of quality in a large number of schools.

and colleges. It must be recognized, however, that unless the program arrangements are carefully considered, television broadcasts could inject a greater uniformity into the curriculum than could be desirable or compatible with American educational traditions. But a wisely designed televised curriculum could do much to provide greater variety of courses in individual schools, and to motivate individual school systems and teachers to undertake creative innovations and improvements.

Airborne instructional television must aim, therefore, to upgrade quality and at the same time to unleash the creative capacities that are inherent in, but sometimes underutilized in, the local schools.

There is no reason why it should put any local school system or local teacher into a curriculum straitjacket any more than, or even as much as, a textbook which is adopted by a large number of school systems.

Improvement of Educational Practices.—Airborne television, properly used, can be a catalyst for inducing a very wide variety of improvements in educational practices, in curriculum, and in teacher training. It can, among other things, provide for the first time an efficient means by which promising new educational developments, experimental results, and important research findings can be quickly communicated to professional educators in all school systems.

Airborne television will not eliminate the need for good teachers in the classrooms, but it will help to make their efforts more productive. It will open new opportunities to make the whole educational process more effective.

Most important of all, it can afford good instruction in schools which find it utterly impossible to provide a full curriculum and to hire enough teachers. And it can establish high standards of instructional quality even in the best of schools.

Long-run Economic Feasibility

The establishment of this pilot programme of airborne instructional television will involve a substantial cost which local school systems could not hope to finance by themselves. In the long run, the economic implications of a well-developed airborne system which serves a large number of schools are highly favourable, since the costs would be spread over a large number of individual students and could readily be absorbed in school budgets.

The Program Established

It is for these reasons that a group of nationally prominent educators from the Midwest announced an airborne instructional television ex-

periment to help lift quality and efficiency of education in a six-state region.

With school and college personnel in the region closely associated with all phases of the experiment, beginning in February 1961 classroom courses on video tape taught by outstanding teachers recruited from all across America will be televised from a DC-6 aircraft some 20,000 feet over the north-central part of Indiana.

Estimated coverage from the 'flying T.V. station' will be a circle 300-400 miles in diameter, reaching from Milwaukee and Detroit to Cincinnati and Louisville. It embraces parts of Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin.

At first programmes will be transmitted from video tape facilities aboard the circling four-engined aircraft some distance away and re-telecast to schools and colleges throughout the region which choose to participate in the project.

Later, the project may include 'line' programmes originating in studios at Purdue University in Lafayette, Indiana, transmitted to the aircraft some distance away and re-telecast from it.

This experiment is an attempt to provide increasing quality of education. Specifically, it will seek to:

- give students educational experiences which often are beyond the scope of conventional means of instruction; for example, demonstrations involving costly laboratory equipment, via television, which might not otherwise be available;

- broaden the curriculum of the smaller schools which are unable financially to offer as complete an educational programme as they would like; for example, by giving excellent instruction in foreign languages, advanced algebra, sciences, art, and music;

- enable the classroom teacher to devote more time to individual learning needs of students;

- enhance still further the skills of classroom teachers by coupling with their talents and personal contacts the additional resources of an outstanding television instructor;

- allow a larger number of students to benefit from such added learning resources;

- help stretch the available school dollar still further and at the same time to improve quality of instruction.

The experiment is conducted in conjunction with Purdue Research Foundation at Purdue University, where the central offices of the project are located. Instructional programmes to be offered will be determined only after extensive consultation with school personnel in the region. The Council will inaugurate the airborne project and assist it through the initial stages. During this time, it expects to work with

educators and lay groups in the six-state region to develop an appropriate form of organization and method of continuing financial support.

The project tries to place education on an economically feasible basis for America's rapidly expanding school population. Estimated total cost of the experiment for the tooling-up year and the first year of broadcasting is nearly \$7,000,000.¹ The initial experiment will be financed with private gifts and grants from philanthropic foundations, industrial corporations, and others. Financing comes from a \$4,500,000 appropriation by the Ford Foundation and by other contributions from private industry. A number of industrial corporations have already given assurances of support. The experiment will begin with two conventional 'wide-band' U.H.F. transmitters aboard the aircraft, so that two different programmes may be televised at once. Ultimately, the number of simultaneous telecasts might be raised to six to offer a far greater variety of courses to schools and colleges.

Aeronautics advisers have predicted that, with a spare aircraft available to meet weather and maintenance contingencies, the telecasting aircraft can be expected to be 'on schedule' at least 98 per cent of the time. The Council will provide guidance to schools and colleges concerning reception equipment and ways of making the most fruitful use of televised instruction.

At the outset, the instructional telecasts will be limited to no more than 24 half-hour lessons a day, during six hours a day, four days a week. As the project develops after the first full year of on-the-air operation—the 1961-62 school year—additional courses will be provided. The Council hopes eventually to telecast as many as 72 half-hour lessons during a school day.

Most courses will be on video tape, recorded either at the Purdue studios or at production centres, including experienced educational television stations, throughout the country. Each course will consist of around 144 half-hour lessons during the school year.

A few such full-length courses, either on film or video tape, are in existence. But most of them will have to be produced 'from scratch'. One of the principal functions of the Council will be to recruit the necessary television teachers and produce their courses on video tape for later telecasting on the airborne project. In co-operation with educators and local television stations throughout the country, the Council is undertaking a nation-wide 'talent search' for teachers.

Films or video tapes made of the teachers nominated by local educators in all parts of the country will be sent to the Purdue studios, where leading educators in the six-state region will make the final selection

¹ £1=\$2.80.

of teachers who will be retained to conduct the televised courses. The Council expects that many of the teachers selected will come from the schools in the region which will be receiving the courses by television. Local school officials, with co-operation of educational television stations, will recommend teachers and send to the Purdue offices of the Council auditions of their work on film or video tape. Here, regional committees of educators will select the best teachers from those nominated. Efforts will be made to find in the local school systems not only those teachers who already have proved their exceptional abilities as television instructors but those superior teachers who have had no T.V. experience and would make outstanding television instructors.

After telecast teachers and alternates have been selected and contracts signed, current plans call for them to gather on the Purdue campus. Here, teacher teams will work with the Council's executive producers, researchers, and graphic arts personnel on the preparation of the courses, study guides, and illustrative materials in order to have the courses ready for recording on video tape. Upon completion of the workshop period, the teacher-producer teams will leave Purdue for the local educational television stations and other production centres around the nation where the actual video-tape recording will take place. The procedure will be repeated every year.

The Council recognizes this plan involves a temporary dislocation of the personal and professional lives of the teachers selected. In light of this, and in view of the fact that the very finest of teachers are being sought for the airborne project, the Council is prepared to compensate the teachers accordingly. Because a teacher of an airborne television course has a potential enrolment of millions of students, such compensation becomes economically feasible, as well as desirable. No exact compensation has been determined yet, but the Council is in the process of working this out. Beyond any monetary compensation, the teachers will benefit greatly from the experience of preparing and conducting such courses. And the local school systems should also profit by their experience upon their return to the local classroom. The Council is encouraging local educational television stations, both in the six-state region and elsewhere in the nation, to re-broadcast these courses at a later date.

Another major function of the Council will be to work with educators in the region to prepare special texts, study guides, and other materials for use in conjunction with the television courses and also to join with schools and colleges in evaluating results of the televised instruction.

JOHN L. PERRY.

GEORGE Z. F. BEREDAY.

New Media—Research Findings in the U.S.A.

DURING recent years in the United States of America there has emerged a popular concern with the quality of the public schools that has taken many forms. One of these has been an increased interest in the use of the newer media of communication as media of instruction. The most publicized of the various ventures undertaken in this connexion has been the series of 'demonstrations' financed by the Fund for the Advancement of Education of the Ford Foundation. At a cost of many millions of dollars, this Fund has supported experiments that generally are intended to show that the main substance of the school curriculum can be taught by the use of television, at least as well as classroom teachers can usually teach it. Moreover, in a period of rapidly rising costs, the Fund has sought to demonstrate that by the use of television the expense of mass education can be considerably reduced.¹

Of considerably greater importance was the enactment of the National Defense Education Act, which seeks to provide funds for a general up-grading of American education. Title VII of the Act is of special interest; it provides \$3,000,000 per year for the specific purpose of supporting experimentation and research in the use of the newer media for instruction in the public elementary and secondary schools.

Educational Television

The use of television in the classrooms of the United States has not yet become commonplace, but it is far from uncommon. A great many schools have television sets, usually placed on tables with castors so that they may be moved from one classroom to another as the need arises. These television sets are used to view programmes of educational interest, such as addresses by major governmental figures, national figures, and the like. They are also used for viewing broadcasts specifically intended for school use. These broadcasts often are carried on commercial television stations. The Federal Communications Commission (an agency of the U.S. Government) reserved 257 television channels for educational use in an order of April, 1952. In April, 1959, forty-two such stations were 'on the air' and seven more

¹ *The National Program in the Use of Television in the Public Schools: A Report on the First Year, 1957-58* (New York: The Fund for the Advancement of Education, January 1959).

under construction. These are publicly owned broadcasting stations, whose main function it is to broadcast programmes of educational value. Here, for example, is the array of programmes broadcast during the spring of 1959 by Station KETC in St. Louis, Missouri :

<i>Title</i>	<i>Subject</i>	<i>Grade Level</i>
A Number of Things Here and There	Natural science Various subjects: Holidays, puppet-making, seeds and plants, the zoo, etc.	Kindergarten Kindergarten Grade 1
Adventures in Learning	Various	Grades 2 and 3
Beginning Spelling		Grade 2
Lines and Shapes	Art	Grades 3 and 4
Learning to Spell		Grades 3, 4, 5, 6
The City Around Us	Social studies	Grades 4 and 5
Science Shelf		Grades 4 and 5
The Storyteller	Literature	Grades 5 and 6
When You Write	English	Grades 5 and 6
Figure It Out	Arithmetic	Grades 4 through 7
What's the News?	News broadcasts for children	Grades 4 through 8
Science at Work	Science	Grades 7 through 9
Discovery	Natural science	Grades 7 through 9
The Missouri Constitution	Social studies	Grades 7 through 9
Advanced High School Algebra	Mathematics	Grades 10 through 12
Decision: The United States Constitution	History	Grades 10 through 12

Most of these broadcasts are twenty minutes in length, though some are a little longer. They are broadcast during the school day, beginning at 9.10 a.m. and ending at 3.25 p.m. There is a broadcast primarily intended for the teachers between 3.25 and 4 o'clock on Mondays. During the balance of the week, previews of coming education programmes are shown for the teachers. These broadcasts are selected by a staff employed for the purpose, after consultation with the teachers in the St. Louis city and county school systems. The broadcasts are subjected to constant criticism and suggestions from the teachers who receive them. It is not compulsory that the broadcasts be used in the schools. Generally teachers may choose whether to make use of a specific broadcast, depending on their opinion of its value to their children.

The enormous popular appeal of television perhaps accounts for the

fact that experimentation with television for teaching has attracted prolonged and in some cases anxious attention from the educators. A great early benefactor of this movement, the Fund for the Advancement of Education of the Ford Foundation, has consistently made use of newspapers and other mass media to announce its grants, and to make claims for experiments that have only just begun. The staff of this organization has defined the chief problems of American public education in the terms of studies of man-power. That is, they conceive of solutions based on re-deployment of the teaching force, re-assortment of teaching assignments so that special abilities will be allowed full play, the re-alignment of expenditures, and the like. Their view of television consequently is that this great disseminative medium should be used to make the greatest teachers available to the largest possible number of students.

This limited view of teaching and education has created the impression among many educational leaders that the Fund, a very potent force, is not primarily interested in improving the quality of the lesson learned, but only in dissemination of what already exists. The activities of the Fund have therefore become the centre of increasingly bitter controversy; members of the Fund staff accuse the educators of being non-experimental, of having closed minds, of worshipping sacred cows. Educators accuse the Fund staff of mindlessness, and speak of fellow educators as having 'sold out', as having been 'bribed', and so on.

This controversy is diversionary and unfortunate, of course. The many other activities of the Fund are masked by it, as are the very important accomplishments in the increased and improved use of audio-visual devices in teaching that have followed from the publicity obtained by the Fund. One of these consequences has been a substantial increase in research into the use of television, film, and other devices as aids to learning.

These grants of funds, both from the Fund for the Advancement of Education and from the Federal Government, are leading to the emergence of research centres in the field of communications in a number of the higher institutions. Notable in this respect are the University of Illinois, Stanford University, Pennsylvania State University, and Michigan State University.

The Exhortatory Stage in Research

Research on the use of television for learning has proceeded through rather clearly marked stages. The first of these can best be described as exhortatory. Between 1945 and 1950, and continuing in some measure since, there has been a series of declarations by educa-

tors and broadcasters concerning the importance of television, the possibilities of the medium, the necessity for careful inquiry, and the necessity for fitting it into the existing educational scheme. One important statement of this kind was made as the result of a seminar which met during June and July of 1949 at the University of Illinois.² The twenty-two members of the seminar issued a statement, *Educational Broadcasting, Its Aims and Responsibilities*. It was necessary at this early point for the members of the seminar to "recognize . . . that broadcasting, like Press and motion pictures, is essentially only a technological tool, which is intrinsically neither good nor evil". The aims of educational broadcasting are identified in this statement as identical with the aims of education itself.

The statement goes on to outline a broad strategy for educational broadcasters and educational institutions. This Allerton House Conference is thought of by the educational broadcasters as a landmark in the development of educational broadcasting in America.

Many other statements of opinion, generally intended to indicate the possibilities and limitations of this medium, have continued to appear. One recent statement is called, *Television in Instruction: An Appraisal*.³ This influential pamphlet, which contained statements on the possibilities of learning by means of television, included a statement of the limitations of television from the teachers of Hagerstown, Maryland, where a large experiment in televised instruction has been under way for the past few years under the sponsorship of the Fund for the Advancement of Education:

Television cannot effectively:

- Lead classroom discussions;
- Clarify immediate misunderstandings stemming from material presented in a television lesson;
- Supervise activities growing out of the lesson;
- Recognize and care for individual differences—the fast and slow learner, the child who may grasp the arithmetic lesson quickly but has to grapple with the complexities of grammar;
- Supervise needed practice in skills;
- Develop problem-solving capacities;
- Provide remedial teaching;
- Help pupils do something about the things they have learned.⁴

On the other hand, it is obvious that through television it is possible to offer an interview with an outstanding individual, offer close-ups

² *Educational Broadcasting, Its Aims and Responsibilities* (Columbus, Ohio: National Association of Educational Broadcasters, Ohio State University, July, 1949. Reprinted November, 1954). (Mimeographed.)

³ *Television in Instruction: An Appraisal* (Washington, D.C.: Dept. of Audio-Visual Instruction, National Education Association, 1958), 24 pp.

⁴ *ibid.*, p. 14.

of things not otherwise easily seen, provide direct instructional presentations from (for example) outstanding scientists, show manufacturing processes and techniques, show art processes, that is, the actual development of an artistic product by an artist.

This kind of statement has been characteristic of each of the new media as it has been developed. Similar statements were developed concerning educational films a generation or more ago, and before that concerning the use of phonograph records.

The Promotional Stage

The second stage of research is usually called 'promotional'. The exhortations having been carried on for a certain time, researchers begin to develop experimental designs intended to demonstrate that the new medium can do what is being done as well as the conventional methods. The purpose of such research is to establish a new medium as representing a possible approach to the known problems of education.⁵ A typical study is that by A. W. Vandermeer, *Relative Effectiveness of Instruction by Films Exclusively, Films Plus Study Guides, and Standard Lecture Methods*.⁶ Or the one by P. H. Tannenbaum, *Instruction Through Television: A Comparative Study*,⁷ and by the same author, *Instruction Through Television: An Experimental Study*.⁸

An inventory of instructional television research was prepared by Hideya Kumata.⁹ Kumata's comments about the state of educational television research bears repeating: there is a "tendency for research to be an afterthought to instructional television efforts. Except in very few studies, a true partnership between performance and evaluation does not exist."

As Kumata and Allen both indicate, the findings from the first series

⁵ Much of what is quoted here is drawn from "Audio-visual Communication Research" by William H. Allen, Systems Development Corporation, Santa Monica, California, 1958. (Mimeographed.) This is a pre-release of a summary of audio-visual communications research prepared for the third edition of *The Encyclopedia of Educational Research*, published in January, 1960.

⁶ A. W. Vandermeer, *Relative Effectiveness of Instruction by Films Exclusively, Films Plus Study Guides, and Standard Lecture Methods* (Port Washington, N.Y.: Special Device Center, Technical Report SCD269-7-13, Instructional Film Research Program, Pennsylvania State College, July, 1950), 51 pp.

⁷ P. H. Tannenbaum, *Instruction Through Television: A Comparative Study* (Urbana, Ill.: Institute of Communications Research, University of Illinois, 1956).

⁸ P. H. Tannenbaum, *Instruction Through Television: An Experimental Study* (Urbana, Ill.: Institute of Communications Research, University of Illinois, 1956).

⁹ Hideya Kumata, *An Inventory of Instructional Television Research* (Ann Arbor, Michigan: Educational Television and Radio Center, December 1, 1956). A project of the Institute of Communications Research at the University of Illinois. See also his article in this volume, pp. 276-93. See Footnote 16.

of research studies conducted on educational television generally showed no significant difference in performance on final examinations between television students and those taught through the usual classroom procedures. What is characteristic of most of this controversy is that television as a whole is taken as a variable. Thus, in the report on the national programme in the use of television in the public schools of the Fund for the Advancement of Education,¹⁰ a significant difference in accomplishment was found in favour of the television classes in twenty-nine instances, and in favour of the control classes in nine instances out of a total of a hundred and ten 'comparisons'. In the remaining seventy-two comparisons, the differences were not statistically significant as between the television and control classes.

However, some research has gone beyond this rather primitive level. In the study conducted at the State University of Iowa,¹¹ the findings are far more discriminating:

... The bibliography method of instruction would appear to be the most efficient means of instruction, while at the same time being at least as effective as the other methods. (The subject here is communication, that is, the development of skills in speaking, writing, reading, and listening.) The hypothesis that the attitude of students toward communication is effected in the same way by each of the methods of instruction may be retained. However, the hypothesis must be rejected that attitudes of students toward these methods of instruction are effected equally by each method. Though students in general seemed to prefer the normal method of instruction, experience with either of the other methods tends to make them much more favourable to the methods which they have experienced.

... The skills of communication appear to have only slight relationship to each other, to knowledge of the principles of communication, to general academic ability, or to attitudes toward communication.

Similarly, in a study conducted at Miami University in Ohio,¹² it was found that college students often become disenchanted with the use of television for instruction.

1. Students assigned to television or large class sections generally do not like them as well as conventional small classes.

2. It is possible to teach a television course in such a way that students actu-

¹⁰ *The National Program in the Use of Television in the Public Schools: A Report on the First Year, 1957-58* (New York: the Fund for the Advancement of Education, January, 1959).

¹¹ Samuel L. Becker, Carl A. Dallinger, Harry H. Crosby, and David Gold, *Communication Skill: An Experiment in Instructional Methods* (Iowa City: State University of Iowa, August, 1958). Supported in part by a grant from the Fund for the Advancement of Education.

¹² *Experimental Study in Instructional Procedures* (Oxford, O.: Miami University, Oct. 1, 1957. Report No. 2). Project supported by a grant from the Fund for the Advancement of Education.

ally prefer it to conventional instruction. This, however, requires a unique combination of instructor, course material, and the full use of the potentialities of television as an instructional medium.

3. Students in at least one course (wherein the problem was investigated) preferred large class instruction to television instruction, although they tended to prefer small class instruction to either large or television classes.

4. Students in television courses tended to become disenchanted with television as a means of instruction during the course of a year.¹³

In a study completed recently at the Pennsylvania State University, it was found that in large classes differences of the kind reported at Miami University were associated with the location of students in a room—that is, whether or not they could see the television set easily.

It is notable that little, if any, research has yet been undertaken in which an attempt is made to study the characteristics of television as a medium in relation to the desired results of the learning experience in schools. It is entirely possible that there is a special 'grammar' or a special 'language' for the form we call television, just as there are forms associated with other kinds of communication. Marshall McLuhan¹⁴ suggests that such facts as that light comes through the image instead of shining upon it, that the message is delivered instantaneously and simultaneously by means of oral and visual means, will undoubtedly have an effect on what one perceives the message to be. Roy H. Pearce¹⁵ suggests that just as surely as there is a special ballet form suitable for television (one does not point the camera at the stage as a whole, but rather selects portions of it), and the choreographer arranges the dance accordingly, so there may well be special forms for dramatic statement via television, or even for a simple explanation of a principle in physics. It seems safe to say that research in this field will not come of age until the special characteristics of this medium are examined closely.

Research and Communication Theory—the Third Stage

The research is becoming far more sophisticated as communications theory continues to be developed. One finds much reference, as Allen¹⁶ points out, to "Wiener's concept of cybernetics, Shannon and Weaver's mathematical theory of communication, and Korschyski's (general) semantic principles. . . ." The general model for communications is summarized in Hilgard's¹⁷ authoritative textbook. The model for a

¹³ *ibid.*, p. 55.

¹⁴ Marshall McLuhan. In correspondence with the author.

¹⁵ Roy H. Pearce. In conversation with the author.

¹⁶ William H. Allen, *Audio-visual Communication Research* (Santa Monica, Calif.: System Development Corp., Sept. 20, 1958). (Mimeographed.)

¹⁷ Ernest R. Hilgard, *Theories of Learning*, 2nd Edition (New York: Appleton-Century-Crofts, 1956).

communication system, as given by him, involves the following elements in the following order: the source of a message, which leads to an encoder, which leads to the communication channel, which leads to the decoder, which leads to the destination of the message. "Noise" may interfere with the communication channel. As C. R. Carpenter¹⁸ points out, it is necessary to introduce into this model between the channel and the receiver or the 'destination of message' a *selective grid*, the term being borrowed from electronics. Carpenter points out that the channel cannot be thought of as a simple 'pipeline', but must rather be thought of as having dynamic properties of its own. In any case the model yields interesting hypotheses that have to do, for example, with the amount of ambiguity that may be introduced into the message, the nature and properties of message-receiver's selective perception of the message, and so on. Research of this kind, however, is just emerging.

Research in Media other than TV

Most of this article has been devoted to research and speculation that has to do with the use of television for instruction. This emphasis reflects the state of affairs in the United States, where the great preponderance of the attention of researchers in the use of the newer media is being devoted to television. However, what can be said about television has in many instances already been said about film. The research in the use of a film for instruction was summarized by Hoban and Van Ormer¹⁹ in 1950. Generally speaking, research into the use of films had demonstrated by 1939 that:

(a) Films can teach factual information effectively over a wide range of subject-matter content, age ranges, abilities, and conditions of use.

(b) Films can be used in teaching perceptual-motor skills, such as the construction of the reed mat, handwriting performance, athletic skills, and the teaching of lathe operators.

(c) Films can be used in developing concepts such as inferring one fact from another, comprehension of complex processes, and so on.

(d) Film can modify motivations, interests, attitudes, and opinions if the film is designed to stimulate or reinforce existing beliefs of the audience. There is, however, little evidence that film can make changes if they are contrary to the existing beliefs, personality structure, or social environment of the individual in the audience.

(e) There is no evidence that film is superior to other media of communica-

¹⁸ In a seminar held in Washington, D.C., under the auspices of the National Education Association, January, 1959.

¹⁹ Charles F. Hoban, Jr., and E. B. Van Ormer, *Instructional Film Research, 1918-1950* (Technical Report No. SDC269-7-19. Port Washington, N.Y.: U.S. Naval Special Devices Center, Instructional Film Research Program, Pennsylvania State College, December, 1950), 180 pp.

tion in influencing general attitudes. The effect of films appears rather to be specific.²⁰

The other media that one usually associates with a topic of this kind are the filmstrip, the phonograph record, lantern slides, flat pictures, other graphic materials, and three-dimensional materials. Little further attention will be devoted to research in these fields here because very little research has been carried on. It should be observed that by contrast with film, television, radio, and phonograph records, the other media are essentially static. They do not present anything in 'motion' or in process except as the viewer infers process from what is objectively a static situation. It is a fact that relatively little research has been undertaken in the field of the use of radio for education since the advent of educational television, though a small number of projects have recently been granted support by the Federal Government under Title VII of the National Defense Education Act. Experimenting in the popular sense continues in all of these fields, of course: that is to say, ingenious teachers develop new applications of these media to educational tasks, but little systematic effort has been devoted to ascertaining the results of such applications, nor does such systematic effort appear to be necessary. A great deal of what necessarily goes on in the field of audio-visual education is of necessity a relatively low order of trial and error, as when a teacher tries stopping a film to bring about discussion of its contents, backs or reverses the film and runs it again, leaves out a portion and picks it up later, and so on, in order to elicit an active participation in the lesson by the students.

It is appropriate to say that the materials of instruction continue to be viewed separately in the American educational enterprise, and that very little has as yet been attempted (except by an occasional teacher who doesn't report it) in bringing together many media of instruction for the use of students. A recent development, the 'language-listening centre', moves in this direction.

However, the field of audio-visual education continues to be influenced by the fact of its own novelty. Before films, phonograph records and phonographs, television sets, and so on, can be bought, those who control the finances in school districts must first be persuaded of their value. Since school districts are perennially short of funds, it is necessary to divert funds from existing uses, or to find new money, before audio-visual methods can be used at their best. This tempts the audio-visual co-ordinator in a school system to promote his materials more or less like a salesman. It leads the manager of an educational

²⁰ This list of generalizations relies directly upon William H. Allen's summary cited earlier.

television station (a very expensive enterprise to maintain) to wish to claim results of the kind that can be most easily understood by the laymen on the board of education. This kind of reality interferes with the subtlety of research, which often cannot produce the answers needed most by the television broadcaster, or the audio-visual director.

Nevertheless, it is predictable that the newer media will be used more and more in the public schools of the United States. The use of such media, and the provision of the necessary funds, is growing now more rapidly than has ever been true in the past.

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*The Typography of Children's Books—A Record
of Research in the U.K.*

THE ease with which people read a page of print, and the degree to which they understand and are influenced by what they read, are all affected by the type chosen for the purpose and the manner in which the type is set out. This truism, as must be obvious from a glance at the advertisements we see in our newspapers and magazines, is fully realized by the commercial copy-writer; yet it is almost wholly ignored by schoolmasters, educationists, and those who write or lecture on methods of teaching. Even the authors of books and primers for children of different ages, as publishers so often complain, seem quite content to leave all questions of typography and format wholly to someone they vaguely call 'the printer'.

The first to recognize the influence of the size and shapes of letters on the facility with which children read and to carry out systematic inquiries into the whole problem were the school doctors. In their routine medical examinations visual acuity was commonly measured by the size of the smallest test-letters which could be perceived at a specified distance; and, since the eye in early childhood is an immature and ill-focused instrument, they naturally concluded that younger children needed much larger print than older children, and put forward explicit recommendations as to the size of the letters appropriate to each age. In Germany, the special difficulties occasioned by the traditional 'black letter' (*Fraktur*) led to a number of instructive studies. Of these, one of the earliest and most influential was that undertaken by H. Cohn, oculist for the schools of Breslau, who attributed much of the defective vision found among older pupils to the badly printed school books and the badly lighted classrooms of his time.¹ Ophthalmologists in other countries followed suit. As early as 1905 we find the Russian government issuing an official note on requirements for children's reading books; it states, for example, that "the height of small letters should not be less than 1.75 mm., the distance between lines not less than 3 mm., the distance between words not less than 2 mm., and the length of line not more than 100 mm."

¹ H. Cohn, *The Hygiene of the Eye* (Engl. transl.) (1886); cf. also id., *Wie sollen Bücher und Zeitungen gedruckt werden?*

The American School Hygiene Association proposed variations according to age, suggesting letter heights of 2.6, 2.0, and 1.6 mm. for "younger, medium, and older children" respectively.

In Britain, when the medical inspection of school children was introduced by statute in 1907, the reports of the medical officers were full of complaints regarding the style of printing adopted in the reading books for infants and junior classes; and in 1912 the Education Section of the British Association for the Advancement of Science appointed a committee to study "the influence of school books upon eyesight". In order to secure factual evidence on the various questions raised, a series of inquiries was carried out during the years that followed by Dr. James Kerr, Medical Officer in the Education Department of the London County Council, and myself as the Council's Psychologist: Dr. Kerr concentrated on the clinical aspects, and, with the willing aid of teachers and inspectors, I undertook experiments in the classroom and the laboratory. The results were published in the reports of the Council and of the Committee of the British Association (1913-17). The main conclusions, together with suggestions due to later experience, are summarized in Dr. Kerr's larger treatise.² Of the various type faces then available, the committee and investigators recommended what are known as 'old faces' rather than the 'modern', and gave chief preference to Caslon; a table of standards was appended, specifying the minimum size of type suitable for pupils of different ages.

In the period between the two wars a number of psychological researches were carried out on general typographical problems, particularly in the United States.³ But for the most part the persons tested were adults rather than children; and the type faces used were, with few exceptions, such as would no longer be employed to-day. During the last two or three decades, however, largely owing to the

² J. Kerr, *The Fundamentals of School Health* (1926).

³ cf. more particularly, M. A. Tinker, "The Relative Legibility of Letters, Digits, and Mathematical Signs" in *Journal of General Psychology* (1928), I, pp. 472-96; D. G. Paterson and M. A. Tinker, "Studies of Typographical Factors influencing Speed of Reading" in *Journal of Applied Psychology* (1929-32), XIII, pp. 120-30, 205-19; XVI, 605-13. In Britain a suggestive monograph was published by the Stationery Office (L. A. Legros, *Note on the Legibility of Printed Matter* (1922), and R. L. Pyke carried out an experimental investigation on adults for the Medical Research Council. Illuminating discussions of the requirements for children's readers will be found in articles by David Thomas ("School Books and their Typography" in *Printing Review* (1934), XIII, pp. 5-8) and by R. D. Morss ("The Neglected School Book" in *Monotype Recorder* (1935), XXXIV, pp. 5 f.). A general review of the experimental work during the period between the two wars will be found in G. W. Ovink, *Legibility, Atmosphere-Value, and Forms of Printing Types* (Leyden, A. W. Sijthoff's Uitgeversmaatschappij, 1938).

enterprise of the British Monotype Corporation and the high aesthetic aims of its advisers, a wide variety of attractive type faces has been introduced; and both methods and styles of printing have been greatly improved. Accordingly, as soon as the Second World War was over, it seemed high time to repeat the earlier investigations with school children, and to re-examine, in the light of further experience, the recommendations then made.

Methods

To study the legibility of different styles of printing, several different procedures have been devised. The following are the commonest, and may be used either separately or in conjunction :

(1) measuring the accuracy with which letters and words can be read, with a brief tachistoscopic exposure which will allow each to be seen for a fraction of a second only;

(2) measuring the ease with which letters, words, and sentences can be read without any narrow time-limit—the measurement being based on the farthest distance at which they can be deciphered;

(3) measuring the accuracy with which the sense of longer passages can be grasped when a limited amount of time is allowed for the reading;

(4) measuring the speed with which passages of prose can be read when the purpose of the reading is to grasp the sense of each passage;

(5) observing, recording, and measuring the movements and the pauses of the eyes during the process of reading;

(6) incidental observation of miscellaneous symptoms indicative of symptoms of eye-strain or the lack of it;

(7) introspective accounts obtained from the readers themselves reporting their experiences, preferences, and impressions.

The conclusions reached with these various procedures are not entirely consistent. Types that appear more legible when judged by the distance-method may prove less legible when judged by speed of reading; faces which increase legibility for isolated letters often diminish legibility when the letters are combined into words or phrases. Evidently the different methods furnish answers to different aspects of the problem, and some choice has to be exercised according to the investigator's special aim.

The majority of psychologists, particularly those who have used adults as the subjects of their tests, have preferred the more elaborate experimental techniques. These usually require complicated apparatus and all the facilities of a well-equipped laboratory. The results so obtained have been of great value in enabling us to analyse the mechanics of the reading process. It is found, for example, that even with the swiftest and most experienced readers the eyes do not glide along the lines in that smooth and uniform way we naïvely suppose;

they jump forward in jerks, pause for a fraction of a second, then skip forward again, making at least four or five brief fixations per line; occasionally the movements are regressive; the eye jerks backwards, as if to re-examine what has just been passed by. On an average each pause lasts for about a quarter of a second, during which a small group of letters is fixated and perceived. When the reading material is difficult to read or understand, the number of pauses may be two or three times as numerous, their duration nearly twice as long, and the regressive movements far more frequent. At the end of the line the eyes sweep obliquely back to start afresh near the beginning of the following line; occasionally, particularly if the reader is inexperienced or the lines are printed too close together, the eyes are apt to skip a line, or, it may be, turn back again to the beginning of the line just read.

As a rule, the practised reader is able to grasp, in each fixation, a short phrase consisting of three or four words, or rather less if one word is long or unfamiliar. The words themselves are generally perceived as total patterns, not as aggregates of letters—a procedure which may result in minor errors akin to guessing. What is grasped in one fixation overlaps with the next; and both in reading phrases and in joining them up into complete sentences, peripheral vision plays an important part. As is clearly shown when the reading is audible, the attention of the more experienced reader lags well behind the point of clearest vision; what he is fixating with his eyes may be half a line ahead of what he is fixating with his mind and uttering with his lips. However, when the reading matter presents difficulties, his optical inspection of the difficult portion may be prolonged until the utterance has almost caught up with the point of vision, so that the 'eye-voice span' is for the moment greatly reduced. All this suggests many obvious improvements in the methods of teaching children to read, and incidentally sheds much light on the nature and the causes of reading disabilities among those who are more backward.⁴

Several investigators have endeavoured to use the same experimental devices for studying the legibility of different types and different styles of printing. But there has been a good deal of criticism both of the methods themselves and of the conclusions so reached. To begin with, the use of instruments and laboratory techniques renders the reading situation highly artificial, particularly for children. Secondly, the measurements obtained do not directly relate to those particular aspects in which the teacher is primarily interested, namely, the speed

⁴ The most thorough studies of these processes among school children are those carried out by G. T. Buswell, who tested small samples from the first school grade up to high school and college standard, i.e. from age 8 to age 19: (*Supplement to Educational Monthly*, No. 17, 1920, and No. 21, 1922).

and accuracy of reading, and particularly the reader's comprehension of the passage read. Thirdly, it is found that the differences in measurements attributable to differences in type face and in style of printing are comparatively small and vary widely from one individual to another; hence genuinely significant data can only be secured when large groups of individuals have been compared, and that is scarcely practicable with instrumental techniques.

We ourselves have found the first two methods mentioned above—the tachistoscopic method and the distance method—quite effective for assessing the legibility of letters or figures presented singly. But for school purposes the chief problem is to determine the legibility, not of letters in isolation but of consecutive passages: what kind of printing will best enable children of various ages to read a paragraph of prose accurately, quickly, without undue fatigue, and in such a way that the sense of the passage is easily grasped? And for this we have found the third and fourth methods—measuring speed of reading and assessing accuracy of comprehension—by far the most effective.

In our preliminary experiments the pupils were tested in class, and a fixed time-limit was imposed. When the time allowed for reading had expired they were required to answer a series of typed questions, intended to discover how far they had really understood what they had just read. In the later experiments each child was tested individually: the time each took to read the entire passage was measured with a stop-watch, and the questions were answered orally; throughout the reading a careful note was kept of pauses, mistakes, irregular eye movements, and any symptoms of difficulty or strain.⁵

In all such investigations the ultimate aim is to compare the relative merits of different typographic styles. But obviously it will not do to give the *same* group of children the *same* passage printed in the different styles. We must therefore work with several different groups of children: group I, for instance, will read passage A printed in style x first; later they will read passage B printed in style y; group II will read A in style y first and then B in style x; with yet other groups the orders will be reversed. In this way it is possible to eliminate the effects of the various irrelevant factors. After all, in spite of the most careful matching, one group of children may nevertheless consist of slightly better readers, and one passage may be slightly easier than the rest. Further, the passage read first, when the children are new to the task, commonly yields the poorest scores, though this can be allowed for by

⁵ Much of the actual testing was carried out by four experienced collaborators—Miss V. Pelling, Mr. T. R. Kingsley, Miss J. L. Martin, and Mr. W. F. Cooper, to whom I am deeply indebted for their assistance.

treating the first trial of all as a kind of shock-absorber and ignoring the results. The most efficient methods of designing experiments so as to distinguish and allow for the effects of a number of different conditions, all varying simultaneously, have been worked out in detail by Sir Ronald Fisher. The particular plan which we adopted was based on that commonly known as 'the Latin square'. By means of an 'analysis of variance' it was then possible to test the statistical significance of the differences found between the average performances with different styles of printing.⁶

TABLE I
SPEED AND COMPREHENSION WITH DIFFERENT TYPE FACES

Type Face	Roman		Italic	
	Time (sec.)	Comprehension (items)	Time (sec.)	Comprehension (items)
Old Style (161)	96	28.0	—	—
Imprint (101)	97	29.1	113	26.9
Times New Roman (327) .	102	27.9	118	25.8
Plantin (110)	105	26.8	129	25.0
Bembo (270)	106	26.5	135	23.7
Baskerville (169) . . .	108	27.0	137	24.8
Caslon (128)	112	27.6	138	25.0
Scotch (46)	114	25.9	108	27.3
Modern Extended No. 1 (7) .	116	25.8	116	26.1
Bodoni (135)	125	25.1	124	25.8

The numbers in brackets refer to the serial numbers of the Monotype Corporation.

Results

(1) *Type Faces* Table I shows the results obtained with the ten commonest type faces.⁷ It will be seen that the three 'modern' faces (Scotch,

⁶ We have found this kind of experimental scheme particularly appropriate in studying the various conditions that affect children's performances in school subjects: a detailed account of the procedure will be found in the article by Mr. Lewis and myself on different methods of teaching reading (*British Journal of Educational Psychology* (1946), XVI, pp. 116-32).

⁷ Since in Britain 'Monotype' machines are now regularly used for the printing of books, we confined our recent work chiefly to 'Monotype' faces; but in point of fact, nearly all the faces mentioned above are also used in other methods of machine composition, such as 'Linotype' and 'Intertype', and in hand composition. Readers who are unfamiliar with the peculiarities of the type faces mentioned in the text will find specimens, and historical notes on their origin,

Modern Extended, and Bodoni) are the least legible.⁸ Among the old faces, Caslon—the type recommended by the British Association—seems one of the least satisfactory, and Old Style and Imprint the two best. Italic proves less legible with almost every kind of type. Many of the more common type faces present special difficulties to children owing to the unusual shape of certain letters. The lower beak on the capital C in Bodoni and Baskerville causes many to mistake it for G; and in Times Roman capital Q is often mistaken for O. In the italic, the J of Caslon, Imprint, and other founts is frequently read as f and the h of Garamond as b, while the old-fashioned Y of Caslon and Baskerville nearly always puzzles the younger readers. On the other hand, in the modern faces, R (with its curling leg) and Q (with its tail starting inside the counter) are more readily recognized than the old face versions, and the larger eye of the modern e makes for greater legibility. Indeed, none of the type faces at present available is entirely without some disadvantage, and there is thus still room for a fresh design to suit the needs of children.

We carried out a separate set of investigations on the legibility of sans serif type. This is frequently used in infant readers; and there have quite recently been strong appeals to adopt it in school books for older children.⁹ At present, it is argued, the child has to cope with six

in the appendix to my book on *The Psychological Study of Typography* (Cambridge University Press, 1959).

⁸ The types grouped under the phrase 'old face' (some of which go back to the fifteenth century) are characterized by (i) light 'colour' (in the printer's sense); (ii) comparatively slight differences between thick and thin strokes; (iii) oblique or 'biased' shading (such as would be characteristic of pen work); (iv) bracketed and sloping serifs, and (v) figures which do not range on the line (though ranging figures are now also available in the commoner faces). The distinctive characteristics of the so-called 'modern' face (introduced towards the close of the eighteenth century) are (i) vertical instead of oblique shading; (ii) an intensified contrast between the thickness of the 'down strokes' and the thinness of the 'up strokes' and curved strokes; (iii) fine, horizontal, unbracketed serifs; (iv) figures ranging on the line, and (v) generally a geometrical and rigidly mechanical structure of the design. Thus the old faces accentuate those parts of the letter that are different; modern faces those that are similar. With the latter, therefore, letters are more easily confused. The excessive thickness of the vertical strokes and the thinness of the rest also reduce legibility; indeed, to a child who is hypermetropic or astigmatic, a word like 'minimum' printed in Bodoni looks like a succession of i's. The more condensed modern faces (extreme examples of which are seen in many French books) look very blurred to the hypermetropic eye; while the expanded forms (sometimes seen in American books) tend to disrupt the word form.

⁹ The name 'serif' is given to the short fine lines that commonly finish off the ends of the main strokes in the letters as now commonly printed (e.g., throughout these pages). A 'sans serif' type face is one that has no such finishing touches.

different ways of presenting the alphabet, since the small and the capital letters have different forms in roman, in italic, and ordinary handwriting—not to mention the numerous subforms. Why not introduce a single simplified style applicable to all these different uses, and for this purpose select the simplest of all, namely, a good sans serif? Four main arguments are commonly advanced in favour of this choice. First of all, what the child really needs to learn is the essential structure of each letter in its simplest form, and this is best given by plain block letters with no serifs at all. Secondly, since every child begins his efforts at writing, not with pen but with crayon or pencil, he necessarily produces letters of uniform thickness, and the thin and tiny serifs are almost invariably omitted at the start. Further, since children are nowadays largely taught reading through writing, the forms should be the same for both. And lastly, it is said, "a truly modern typography should shed the superfluous serifs as decorative excrescences out of keeping with the art forms of a functionalist age".

No experimental data are cited to support these claims, and the psychological evidence leans almost wholly in the opposite direction. Without serifs it is difficult to discriminate many of the isolated characters, e.g., I, l, 1, and (when the reader is astigmatic) ! and i. So far from the serifs being merely decorative, they help to correct the effects of irradiation ('visual spread'), and encourage 'the horizontal movement of the eye' along the line. Moreover, almost from the outset, what the child chiefly learns to recognize are not isolated letters (unless they have been expressly taught as separate units), but patterns of entire words, and the organizations of such patterns is aided by the presence of serifs, while their rhythmic structure arises largely from the variation of thick and thin. Finally, no matter how he has been taught, every pupil will sooner or later be required to read words set in serified type, with *a*'s, *g*'s and the like which do not conform with the shapes used in ordinary writing.

When sans serif type first made its appearance in children's reading books, Dr. Kerr and I carried out several investigations into its alleged

In addition every stroke is of the same uniform breadth: there is no contrast between thick and thin.

Among teachers sans serif type seems first to have been popularized by Miss Nellie Dale. In the *Dale Readers* (1899) new words are presented first in sans serif, and then incorporated in illustrative sentences set in a semi-bold Modern. Several later publishers have printed their earliest 'Readers' entirely in sans serif, changing afterwards to an old face like Baskerville or Bembo. In Germany, sans serif achieved a great vogue during the hey-day of the Bauhaus school; and in this country Wyndham Lewis's *Blast* and later Herbert Read's *Art Now*, both printed wholly in sans serif, seem to have done much to persuade the enlightened teacher that this kind of printing is "artistic in the modern sense".

merits, and concluded that of all the available founts a sans serif type face was the least satisfactory as judged by word recognition. No doubt, with older children and with adults, the differences observed are partly due to the fact that most of them have been habituated to a serifed type, but this is by no means the only factor. Observation of eye movements shows that with sans serif there are more fixations per line and more regressive eye movements. Attempts to test the reading efficiency of comparable batches of children indicate that those taught with non-serifed reading books read more slowly and are decidedly poorer in grasping the sense. These conclusions have since been confirmed by later American investigators, who also found "serifed types more legible than unserifed".¹⁰ Nevertheless, for certain specific purposes a good sans serif type (such as that designed by Eric Gill) unquestionably has its uses. As the writers of advertising copy have found, it is highly effective for short, sharp, emphatic statements; and, as our own investigations demonstrate, it is particularly suitable for certain kinds of numerical tables, especially those containing *short* numbers (e.g., hours of trains, and so on, in railway time-tables, where it has the further advantage of economizing space). For longer numbers (like those found in mathematical tables of logarithms and the like) it is less satisfactory, presumably because figures without serifs do not combine so readily into distinctive groups.

(2) *Size* In studying the influence of size of type we confined our comparisons mainly to the two or three type faces that had proved most satisfactory for school children. In our earlier investigations we began with Old Style, but, when Times New Roman had been introduced, we changed to this, since it seemed likely to become one of the most widely used founts and has no marked leanings towards any peculiar characteristics either in design or in heaviness.

The British Association Committee tabulated its recommendations in terms of *minimum* size, with specimens in Caslon. We found however that, especially with older pupils, a type face might err by being too large as well as too small. Big letters are no doubt the most legible when read singly (as in the oculist's test chart), but when used for consecutive prose they tend by their size to direct attention to the letters themselves rather than to the pattern of each word, and to single words rather than to groups or phrases. Moreover, the larger the type the smaller the amount of reading matter falling within the normal eye-span, and the greater the number of eye movements and fixation pauses; thus comprehension as well as speed is hindered. This is a marked defect in many of the pre-war books for young children, and

¹⁰ cf. J. Kerr, *op. cit. supra*, p. 552, and H. R. Crosland and H. Johnson, *Journal of Applied Psychology* (1928), XII, p. 121.

for these reasons we decided to formulate our standards in terms of optimum rather than minimum sizes. The results of our most recent experiments are shown in Table II.¹¹ It should be added that there are wide individual variations; in particular, children with defective vision commonly need a larger type face than others of the same age.

TABLE II
TYPOGRAPHICAL STANDARDS FOR CHILDREN'S READING BOOKS

Age (years)	Type Face (points)	Type Body (points)	x-height (in.)	Inter- linear Space (in.)	Number of Lines per Vertical 5 in.	Number of Letters in a Line of 4 in.	Length of Lines (in.)
Under 7 . . .	24	30	0.150	0.260	12	30	5
7-8 . . .	18	20	0.111	0.170	18	38	5
8-9 . . .	16	18	0.090	0.160	20	45	3½
9-10 . . .	14	15-16	0.075	0.130	24	52	3¾
10-12 . . .	12	14	0.068	0.120	26	58	4
Over 12 . . .	11	12	0.060	0.100	30	60	4½

In column 7, 'letters' includes spaces as well as lower-case characters, the space between two words being counted as one 'letter'.

(3) **Bold Type** For younger children, and for readers who are hypermetropic or astigmatic, legibility is much improved by increasing the heaviness of the type.¹² But the amount of thickening must be

¹¹ The size of a type is commonly stated in terms of 'points' (1/72 in.); but this refers to the size of the 'body', not of the printing surface. With different faces of the same body size (measured in points), the 'x-height' (i.e. the height of those small letters that have neither ascenders nor descenders) varies considerably; for example, with 10-point type the x-height of Times New Roman is 0.062 in.—equivalent to that of 11-point in Imprint, whereas that of Bembo is only 0.050 in. A rough notion of the effects of the above requirements will be obtained by glancing at the Graded Reading Test printed in the London County Council memoranda (cf. C. Burt, *Mental and Scholastic Tests*, Test 1, pp. 340-1).

The text of this volume is set in a Linotype face known as 'Pilgrim', based on a design by Eric Gill: the size of the type face is 10 point, but it is set on an 11 point body. The 'measure' (length of line) is 25 ems, i.e. 4½ in. The footnotes are in 8 point set on a 9 point body.

¹² Several American studies have been made on the effects of varying heaviness of type: see more particularly, M. Luckiesh and F. K. Moss, "Boldness as a Factor in Type Design and Typography" in *Journal of Applied Psychology* (1940), XXIV, pp. 170-83, and idem, "Criteria of Readability" in *Journal of Experimental Psychology* (1940), XXVII, pp. 256-70. Unfortunately the subjects tested were adults only, but the work brings out certain instructive points. For results obtained with children, see C. Burt, W. F. Cooper, and J. L. Martin, *British Journal of Statistical Psychology* (1955), VIII, pp. 29-57.

fairly uniform and should not be too great—points often overlooked by those who print reading books for beginners. In such letters as 'a' and 'e' excessive thickening tends to reduce the size of the 'counters' (i.e. the white inner spaces). In several type faces (e.g. Times Bold) boldness is achieved mainly by thickening the vertical strokes: Times Semi-bold avoids any such disproportionate variation, but its set is a little too narrow, especially in the larger sizes. Plantin owes much of its legibility to the fact that it leaves a darker impression, especially on uncoated paper, but the peculiarities of many of its letters are somewhat confusing for younger readers. For them one of the most legible founts would seem to be a semi-bold 'old style', e.g. Monotype Old Style Antique—a type design which now seems to be seldom used for ordinary bookwork.¹³

(4) *Spaces between Lines* The introduction of what the printer terms 'leads' (thin strips of metal inserted to widen the spaces between the printed lines) greatly enhances legibility. This increased interlinear spacing helps the eye to pick up the right line as it moves back from the end of one line to the beginning of the next—a point of special importance with younger readers, who are extremely prone to doubling and skipping. However, if it is too wide it tends to diminish legibility; like excessive letter-size, it increases the number of eye movements and fixation pauses. In the table above, the optimum standard for interlinear spacing is measured from the 'base-line' of one row of letters (i.e. the bottom of the non-descending letters) to the top of the non-ascending letters of the row next below. Generally speaking, the distance between the rows or lines should be about half as wide again as the x-height and about one-thirtieth of the measure—rather more with younger children, rather less with older. When the type chosen is large on its body or has long ascenders and descenders, it is always desirable that the leading should leave a clear separation between the two lines, especially when a descender comes directly above an ascender.

(5) *Spaces between Words* The printer's convention that the right-hand margin of the text (as well as the left) must be perfectly even tends to produce wide variations in the way words are spaced in different lines, particularly if the lines are short. During recent years most printing firms have deliberately inclined towards as close a spacing as possible. With Monotype the minimum interval between words

¹³ This was the type used in setting the Reading Test described above, and it has since been adopted by several education authorities in printing tests of ability and attainment.

is that of the comma or full stop—a 'thin space' of three units¹⁴; in practice, the intervals are rarely less than four units (the space automatically made by the machine before 'justification'); and most printers try to avoid anything wider than five units (a 'thick space'). For younger children I would suggest at least double this amount of spacing, and even for older children a 'thick space' should in my view be the minimum rather than the maximum. Another convention in contemporary printing which sometimes causes difficulties with younger children is the printer's preference for a minimum of stops to avoid a 'spotty page'. For the reader who is just beginning to tackle long and complex sentences therefore I would suggest a meaningful variation in the word spacing; this would assist him in analysing the underlying thought by marking off larger and smaller units of thought, much as a good speaker would vary the length of the pauses in reading the passage aloud.

(6) *Measure* The most suitable length of the line—the 'measure' as it is termed—should vary, not only with the age and experience of the reader but also with the type, the interlinear spacing, and even with the subject-matter. When the lines are unduly long it is difficult for the eye to pick up the right line in turning from one line to the next, and pages filled with solid chunks of printed matter are bound to daunt the keenest youngster. On the other hand, with older children lines that are unduly short prevent the eye from taking in large phrases and from making the most of the help supplied by peripheral vision. Moreover, short measures (e.g., when there are two columns to a page) not only necessitate irregular spacing between the words, but also increase the frequency of broken words at the end of lines—features which inevitably hinder reading.

The main criterion, however, is not the absolute length of the line but the number of letters or words it contains. With adults and with older pupils our experiments indicate that the most satisfactory type face will have an x-height of about 0.06 inches (i.e. 10-point Times—11-point with most other faces); and with a type of this size measures shorter than twenty ems¹⁵ or longer than thirty-three ems diminish both speed and ease of reading. These are limits of $3\frac{1}{2}$ to $5\frac{1}{2}$ in., that

¹⁴ A unit is one-eighteenth of the width of an 'em quad' (the width of the body for an upper-case W). The older specifications in terms of millimetres or fractions of an inch are quite useless because the requisite space must obviously vary with the size of the letters. Specifications in terms of units hold good no matter what the size.

¹⁵ The 'measure' (i.e., the width to which type is set on the printed page) is generally stated in terms of 12-point 'ems', i.e. in multiples of one-sixth of an inch (a unit sometimes designated—not quite correctly—a 'pica'). Dividing by six, therefore, gives the width in inches.

is, with the type specified, about fifty to eighty characters (letters and spaces), or on an average, twelve to thirteen words per line. With pupils aged 8 to 12 shorter measures are desirable, and with pupils under 8 somewhat longer measures. The last column in Table II sets out in detail what seems to be the most suitable length of line for school children of every age.

For young children I have elsewhere suggested dispensing altogether with the need for keeping to a uniform length of line throughout the page. With the beginner, the length should be determined rather by the meaning and the organization of the thought than by mere typographical conventions. Each line should end with the end of a phrase, leaving the right-hand margin irregular.¹⁶

(7) *Margins* In nearly every reading book we have examined the margins are far too narrow. As experiment clearly shows, books with excessively narrow margins are far more apt to produce visual fatigue; and, when the type area extends nearly to the edge of the paper, the eye of the younger reader will often swing right off the page. For senior pupils we suggest the following proportions, expressed as fractions of the measure: inner margin $\frac{7}{40}$, head $\frac{9}{40}$, outer margin $\frac{11}{40}$, foot $\frac{13}{40}$. The total, it may be noted, adds up to the size of the measure, and the measure itself (i.e. each line of type) will occupy about two-thirds of the width of the page. For younger children the proportions should be much wider, allowing plenty of room at the bottom for the thumb, and at the sides for the untrained eye to swing to and fro.

Conclusions

For the sake of clarity I have had to discuss each of the foregoing factors separately and in succession. All of them, however, are closely interdependent—a complication thoroughly familiar to the printer, but too often overlooked by psychological writers. The length of the printed line, for example, and the most suitable spacing of lines and words, must vary according to the size, face, and heaviness of the type selected, and vice versa, and to state optimum figures for the former without specifying the latter may be extremely misleading.

Moreover, in considering the influence of the different factors I have confined myself solely to their effects on legibility and ease of comprehension. After all, the primary function of the printer is not to delight

¹⁶ This device is exemplified in some of the introductory 'Beacon' and 'Happy Venture' Readers, where the lines are not 'justified', and the inter-verbal spacing can therefore be strictly equalized throughout. In printing verse it has long been the practice to allow both right- and left-hand margins to vary so as to bring out the metric structure of the stanza.

the eye, but to afford the reader the swiftest access to the author's thought. Nevertheless, the design, selection, and arrangement of type faces is an art as well as a craft. Teachers have of late taken considerable interest in the improvement of the aesthetic qualities of the child's style of writing; they should be equally alive to the need for aesthetic improvement in the manner in which school readers and textbooks are printed and produced. As Ruskin, Morris and Edward Johnson insisted in the days when British printing was at its lowest ebb, the pleasure derived from reading may be greatly enhanced by increasing the beauty of the printed page itself. Further, as our experimental results have amply proved, "printed material proves more legible, and reading becomes quicker and more accurate, when the material is set in a type which the reader finds, often without realizing it, aesthetically attractive".

There is one final suggestion I would venture to make. Those who write educational books for children seldom seem aware of the way these innumerable variations in typographical style can be exploited in one and the same book to aid the reader's understanding of the subject-matter. Quite apart from the obvious expedient of italic and of large or small capitals for headings, sub-headings, and the like, and small type for footnotes, the organization of the thought can be greatly assisted by using type varying in size and boldness, by setting subsidiary paragraphs farther in, and by other self-explanatory devices for typographical display. Too often the author leaves all these refinements to the publisher or printer, while the printer and publisher tend to base their choice on conventional or economic grounds rather than educational or psychological.¹⁷ The most pressing need, therefore, is for all

¹⁷ In the days when texts were set by hand, full advantage was commonly taken of these possibilities. I have before me what in its day was one of the most popular books on teaching, printed over sixty years ago (A. H. Garlick, *A New Manual of Method*, 1897). The layout and mode of presentation have (as the author puts it) been "carefully methodized" in order to elucidate the logical structure and development of the writer's arguments; apart from variations in headings, sub-headings, and sub-sub-headings, four different sizes of type are used to distinguish generalisations, proofs, illustrative instances, practical corollaries, and the like; the faces include not only roman and italic, but bold, semi-bold, and sans serif, expressing different shades of importance or emphasis; there are four degrees of indentation for the paragraphs (duly lettered and numbered); and some of the material is set in two parallel columns to bring out analogies or compare pros and cons. Now that type setting by machine has become the regular method of book production, there has been a tendency (largely on the grounds of economy) to avoid, so far as possible, anything that cannot be set from a single matrix of types. Where scholastic textbooks and manuals are concerned, the consequence has been a needless sacrifice in clarity. With a seven-alphabet matrix case, roman, italic, and bold faces, including both upper

the various specialists to get together—teachers, psychologists, oculists, and typographers—and endeavour to understand each other's aims and each other's point of view; it will then no doubt appear that there are a large number of urgent problems calling for experiment and co-operative research, in which each of the different experts will join and to which each of them will contribute from his own practical knowledge and experience.¹⁸

and lower case, together with 'small caps', can be set on the same machine. With a duplex keyboard two sizes can be used at the turn of a switch. With more than two the copy is distributed between several machines, and this entails a little extra work at the make-up stage.

¹⁸ Several publishing houses have recently taken an active interest in the improvement of scientific and technological works for older readers; see, for example, G. Parr (of Chapman and Hall) and J. W. Godfrey, *The Technical Writer* (1959), and C. Batey (of the Oxford University Press), P. R. Barrett, and T. W. Chaundy, *The Printing of Mathematics* (1954). Still more recently, the Cambridge University Press have planned a series of inquiries into improving the comprehensibility of its scientific books and periodicals; but, so far as I am aware, nothing of this sort has as yet been attempted in regard to the production of books for school children.

CYRIL BURT.

Television, Education and Research

THIS article discusses the implications for educational policy and research of a four-year inquiry into the effects of television on the young which was carried out by the author and her colleagues. The series of studies are described elsewhere.¹ Here we shall make reference only to those results which are of particular relevance to educationists: to the effects on knowledge, and school performance, on interests and values, and on the use made by teachers of this new medium. Such studies are essentially studies of profit and loss; they consist of the drawing up of a balance sheet where the effects of the new activity are charted and weighed against the effects of those activities which have been reduced or displaced to make time for viewing.

Our task, then, lay in building up a picture of the changes brought about by television. For this we adopted the conventional experimental method of comparing the two groups, only one of which had been exposed to the variable, i.e. had television at home (the viewers). For such comparison to be meaningful the two groups had to be as similar as possible. With this end in view we matched individually each viewer with a control child for sex, age, intelligence, and social background, and, where possible, chose both from the same classroom. This study, which will be referred to as the *main survey*, was carried out in four English cities on 10 to 11 and 13 to 14-year-old children.² And yet, despite the closeness of the matching, we could not be sure that the differences were, in fact, due to viewing. After all, the children's families differed from each other to the extent that one family had decided to buy a television set, whilst the other—despite similar incomes—had preferred to use their money in other ways. Such variations in parental attitude might well find expression in the children's attitudes and behaviour, i.e. be pre-existing differences.

To make an adequate differential diagnosis a *before and after study*

¹ This inquiry, which was undertaken on behalf of the Nuffield Foundation, is published as *Television and the Child*, Hilde T. Himmelweit, A. N. Oppenheim, Pamela Vince (Oxford University Press, 1958). See also *Some Contributions of Home Television Viewing to the Education of Children*, A. G. MacLaine, Ph.D. Thesis (University of London, 1957).

² Out of 4,500 pupils tested, a total of 1,854 matched viewers and controls was obtained. The remainder, mainly guest viewers, were excluded from the analysis.

would be needed. The erection of a television transmitter near Norwich made this possible. We tested all the 10 to 11 and 13 to 14-year-old children in the Norwich schools at a time when hardly a family owned a television set, and a year later retested those children who had since acquired a set together with a matched control group. Differences found at the first testing between future viewers and controls would constitute pre-existing differences, while those which showed up on retest only might reasonably be ascribed to viewing. An example will make this distinction clear. In the main survey we found that viewers attended Sunday school less regularly than controls. The before and after study showed that this difference already existed between future viewers and their controls and could not be ascribed to television. We could not confine ourselves to the before and after study, since this revealed the immediate rather than the long-term effects of viewing, while the main survey included what we termed veteran viewers, i.e. children who had watched television for three years or more. Furthermore, the main survey made it possible to study the extent to which reactions varied depending on the age, sex, intelligence, and social background of the child. For this we needed a factorial design which made possible the assessment of the influence of one background characteristic, e.g. age, while holding the others constant.

Two main categories of effect were studied; those which relate primarily to the time taken up by viewing (the displacement effects) and those which derive more directly from the content of the programme. The eleven separate studies of the survey examined the effects of home viewing, not that of schools television watched in the classroom. We concentrated on home viewing, because the many studies carried out in the United States had clearly shown that information can be absorbed from programmes specifically designed to instruct and that, in general, such information is retained about as well as that provided by conventional classroom procedure. What had not been done, however, was to assess how far programmes designed primarily to entertain rather than to instruct, and watched casually at home, would still make an impact upon the child, affect his view of society, his values and interests, his scholastic knowledge and range of general information.

Television viewing undoubtedly takes up more of the child's leisure time than any other activity. On average, a child spends two hours a day viewing. How much a child views depends not on the social level of his home, but primarily on his intelligence. The more intelligent the child, the less time he devotes to television. This is true also of the 10 to 11-year-old, even before homework becomes a complicating factor. Within a given intelligence level, how much a child views de-

pend upon parental example and the child's range of interests and general adjustment. A child with few hobbies whose parents are inveterate viewers, who in addition is shy, will tend to watch a great deal. Television is not the overwhelming attraction it has been made out to be. It was, for instance, rarely mentioned in the diaries which the children kept as the most-enjoyed activity. Television viewing is more of a pleasurable 'also ran' that takes up more time than interest.

We found effects on bedtime, homework, concentration at school to be slight, even though in 60 per cent of the homes (evenly distributed over middle- and working-class families) television was on all the evening.³ To make room for viewing children gave up or reduced those activities which were of marginal interest and those which were functionally similar—like radio listening or, in the case of the younger children, cinema attendance. For the older children a visit to the cinema was also a social occasion away from home; this television could not satisfy, consequently they tended to give up other things rather than their cinema visits. It is thus the functional rather than the apparent similarity which counts.

Effects on Reading, Knowledge and School Performance

The effect of television on reading proved complex. Reading was at first substantially reduced, but in the majority of cases increased after a time, until for the veteran viewers and their controls no difference was found in the amount of leisure reading. Television affected the type of reading material selected. Fewer comics were read. (The needs they satisfy are better catered for by television.) The taste in books changed; it became more mature, extending over a wider range of topics, including non-fiction. Several libraries commented on the growing demand for non-fiction books. While book reviews on television proved ineffective, dramatized serials led more viewers than controls to read such books as *Jane Eyre* or the *Prince and the Pauper*. Comparison with book reviews or dramatized serials on radio showed television to be the more effective stimulant. Television, then, can exert a specific impact and it can also change the emphasis or direction that a particular activity takes.

In a survey of teachers' opinions, the teachers frequently quoted examples of the way in which children produced information derived from home viewing, especially from nature programmes. Our own study confirmed that children understand and accurately remember many facts presented during each programme. In this context it is

³ But it must be borne in mind that at the time at which the inquiry was carried out there was no television between 6 and 7 p.m.

important to remember that we are concerned here with the casual viewing done after school hours, i.e. we are assessing incidental learning. And yet, while individual items of information were retained, there seemed to be little carry-over to a broader understanding of the subject, so that neither the attainments nor the interest in related school subjects tended to be substantially higher for viewers than for controls. For such carry-over to occur, the teacher's help is needed.

The need to consider the effects of television in terms of a balance sheet become nowhere clearer than when considering its effects on general knowledge, school performance, and interests. Three factors have to be taken into account in arriving at the final assessment: (1) the level and quality of the information offered on television; (2) the availability of, and the use that could otherwise be made of, other sources; and (3) the relative capacity of the child to learn from them. It is not surprising, therefore, that our results should vary with the age and intelligence of the child. On the whole, we found that television benefited mainly the younger children of average, and below average, intelligence. Their scores on general information tests tended to be ahead of those of the controls, the gain amounting to about four months of normal development in general knowledge. Television, to some extent, acts as an equalizer; it reduces the gap between children of differing intelligence, though it cannot bridge it. At the same time the scores of the older children, compared with those of the controls, tended to be a little lower. It would seem, then, that the level of information offered is relatively low and makes its impact particularly on those for whom other sources of information are not readily accessible, i.e. on children who read little. In the case of the grammar school children in particular the effect, while slight, was to retard rather than to accelerate. The quality of information provided by television was not sufficiently high to compensate the brighter adolescents in grammar schools for the expenditure of time it requires.

The 13 to 14-year-olds of I.Q.'s of 100-114 and the 10 to 11-year-olds of I.Q.'s of 115 and above, did somewhat better in general knowledge tests the longer they had had television in the home.

Taken all in all, the effect on school work tended to be slight. On the whole, the brighter children of both age-groups lost a little. Altogether 47 per cent of the controls were doing better than the viewers matched with them, and 36 per cent of the viewers were doing better than their controls, a difference which is not, however, statistically significant. The differential results have a bearing on a teacher's decision whether to use school television or not. They show that each teacher in deciding whether his pupils should watch school television ought first to draw up just such a balance sheet, one which offsets the gain derived

from discussion or reading against those obtained from watching a stimulating television programme.

Influence on Interests and Attitudes

Comparative analyses of the interests of viewers and controls showed a trend, though slight, towards a broadening rather than a narrowing of interests. How far are interests translated into action? Once again, reading seems to be an exception; here we found considerable additional reading taking place as a result of stimulation through books serialized on television. Make-and-do competitions, on the other hand, proved remarkably ineffective and, indeed, less effective than comparable competitions in comics and children's magazines. Nor did the attendance at a museum increase after a children's programme had featured its exhibits.⁴ Its influence, if any, would come from the consistency of the values it offers, from its prevailing entertainment pattern. Our content analysis had shown the values of television drama to be surprisingly consistent. A child draws for his knowledge of the world, of social relationships, for his image of adult life, on all available sources of information. He picks up cues wherever they are offered.

Using a variety of devices, some projective in character, we found television did exert an influence on the children's values and outlook. What it did not do was to make children feel that their everyday life was drab and uninteresting, nor did it make them less interested in school, nor blunt their ability to differentiate between fact and fiction. Indeed, in certain respects, the children's attitudes were more sophisticated than those of the controls. Much exposure to adult plays and to documentaries leads many of the children to reject at an early age the comforting black-and-white philosophy of childhood tales. Where television had made a positive impression it proved subtle and consistent. Television affected children's vocational aspirations—it broadened their knowledge of the prestige hierarchy of different occupations and in a number of respects produced in them a more middle class value orientation. They were also affected by the materialistic outlook inherent in many television plays. For instance, when asked what sort of adults they would like to be, they tended to think more of the things they would like to own rather than of personal qualities or the work they would like to do.

The difficulties of adult life which form the principal theme of so many television plays had also an effect on adolescents, the age-group

⁴ At the Ashmolean, Oxford, we were able to carry out a direct effects study, one in which the children were not asked whether the programme had stimulated them, but where such stimulation was directly measured.

particularly sensitive to information about the adult world that they are about to enter. Here we found viewers, compared with controls, more curious about the problems of adult life, about leaving home, finding a job and about marrying. Since these differences were not found between future viewers and controls, it is likely that they are due to the early and frequent exposure to problem plays which rarely offer any satisfactory resolution of the conflicts they feature. Attitudes to foreigners, we found, effectively changed in the direction of greater objectivity.

From the foregoing, certain general principles may be laid down. We concluded that the impact of television on attitudes and values will be the greater when the views put forward are more stereotyped and when they are presented in dramatic form. The greater the interest of the viewer in a particular field and the less complete his knowledge from other sources, the more responsive he will be to the medium in general.

Significance of the Findings for Future Educational Policy

(1) We found that only 6 per cent of the teachers claimed to make regular reference to television. It is hoped that more teachers will bring television into classroom discussion, so that fleeting interest in topics can be made more lasting and that items of information absorbed through television can be integrated into a broader body of knowledge.

(2) There is need for far more interchange of ideas between teachers and television companies—in the form of positive suggestions as well as criticisms. However, such interchange of ideas becomes effective only if it derives from first-hand knowledge of the effects on the children and in a context in which teachers view television as an opportunity rather than as a threat.

(3) Our findings point to the need for more and continuous research, for the follow-up of the impact of individual programmes, and, above all, for the careful testing of the conditions under which the interest aroused by television can be translated into action. It would be nonsense to conclude from our findings that children cannot be sufficiently stimulated by make-and-do programmes to make things on their own. The problem should be restated in a positive way: under what conditions and with what material can we get children to undertake something by suggesting it on television? The failure to get a response is only too readily ascribed to the apathy of the viewers—it is much more likely due to insufficient experimentation, to a lack of communication in terms which have meaning to the child.

(4) The same applies to programmes designed to transmit ideas. Is

this best achieved by verbal explanation following visual exposition or vice versa? How true are the beliefs held by many producers that viewers will be stimulated by a panel discussion rather than by interview or straight exposition? These are but a few of the many questions which need investigation. There must be a systematic variation and assessment of different ways of transmitting ideas.

Television, although a visual medium, relies for the transmission of ideas on the use of words. How far, then, is the vocabulary used for this purpose a barrier to effective communication? How far are specialist terms needed; how far is communication prevented through using words which are the prerogative of those who read *The Times* or *Guardian*?

(5) Our findings, derived from home viewing, have relevance to schools television. It is here that the type of profit and loss account which we have developed becomes especially important. If three teachers who taught comparable groups of children agreed to cover a topic for which a schools television programme had been designed, before and after tests could measure the gain in precise information and in general understanding of the subject. One group would watch the programme, the other would spend time reading, and the third would be taught by ordinary classroom methods.

(6) The main research must be carried out by those who put schools television on the air. I hope that teachers will come to insist on seeing the research account of the value of last season's programmes for the type of pupils they are teaching before deciding whether to make use of the programmes offered.

In theory, television companies are in favour of research, but regret their inability to do anything more than carry out a very superficial investigation. They plead pressure of time and financial commitments. In no other industry would such an explanation suffice. If one takes the pharmaceutical industry as an analogy, it is taken for granted that the onus of proof that the drugs offered are of value lies on the industry. Similarly, as long as television companies are interested in asking schools to devote time to their programmes, it is incumbent on them, using research, to demonstrate that such time would be well spent. This is so very important, because research is the necessary impetus for continuous and sound experimentation. We know so little as yet about the best way of putting ideas over. It has been argued that the same applies to other mass media. This is true, but omissions in the past do not justify omissions to-day, and further, the very novelty of the medium and its ephemeral character makes such research more urgent than, for instance, in the case of books which can be examined

by the teachers before presenting them to the children. In the case of schools television, the teacher is asked to take something on trust. This is in no way a criticism of the quality of school television programmes; the need for research is as urgent where programmes succeed as where they fail.

HILDE T. HIMMELWEIT.

Area Studies

IN this section of area studies our intention was to present a representative, but by no means complete, picture of the organization and use of new media in schools throughout the world. Each contributor was free, however, to select from our general directives any aspects he wished to emphasize. These articles consequently show how varied are the problems associated with the use of new media. The manner in which each country attempts to solve them depends not only on national norms and institutional arrangements but also on the economic resources of the country, its communication system, and the extent of its territory.

There is, however, general agreement on certain points. First of all it is appreciated that the choice of media available to the teacher is now vast. Textbooks, blackboard, wall charts, flannelgraph, maps, and filmstrips are among the purely visual aids. Gramophones, tape recorders, and sound radio supplement the teacher's aural presentation of information. Moving films and television are the most widely used audio-visual aids. There is general agreement among contributors that each of these aids serve certain educational purposes better than others. Not all of them are equally effective under all circumstances. The effectiveness of a particular medium depends not only on the purpose for which it is employed, but also on the manner in which it is employed. There is fairly general agreement, for example, that the gramophone is valuable in language teaching and particularly for the improvement of pronunciation. The tape recorder has, however, certain technical advantages—notably, for example, the absence of extraneous noise. Of course the gramophone has been in service for a considerable number of years, so that experience and experiment have helped to perfect its educational use.

From these many media teachers can make their choice. Obviously, as an aid each medium is capable of certain effects. The dramatization of presentation is one. Historical sequences can be shown, and in this respect friezes prepared by pupils might be one of the most successful methods. Essentially moving processes in science can also be illustrated by new media. Indeed, both in the arts and science certain material which in print might be unintelligible to students can be presented, thus extending the variety of topics available to the teacher.

Most contributors accept as valuable new media of this kind. They are reluctant to admit, however, that new media might, under certain circumstances, actually replace the teacher. M. Lefranc, however, points out how France, suffering as most countries from a shortage of teachers, is prepared to experiment with special telecasts making autonomous use of audio-visual aids.

The objections to the wider introduction of new media into the classroom are of two types. Some resistance is of a technical nature; other objections are based upon more fundamental theories of education. Among the first group might be mentioned the general shortage of suitable moving films. A variety of reasons are given for their unsuitability—subject matter, method of presentation, length of film, commentary, and so on. M. Gelmont's description of educational filmmaking in the U.S.S.R. is therefore instructive. There are many types of film, among which the lesson-thematic, the theme-review, the plot and game, and the popular science demonstration might be mentioned to illustrate the variety. The length of a film is carefully adjusted to its purpose; the age of its prospective child audience taken into account; and the learning process carefully considered.

There are other technical difficulties. To use most of the newer media without organizational disturbance either of pupils or equipment demands special facilities. Many schools are not well-designed from this viewpoint. Improvements in the construction of schools and in the technical qualities of the new media equipment are clearly helping to remove some of these difficulties. Still needed, if new media are to be used more extensively, are easy access to whatever material is available and more systematic training of teachers in the technical use of the equipment. Film and record libraries, among others, are necessary. The storing, cataloguing, and distribution of such materials present considerable technical difficulties. There are also the problems of relating material presented through new media with the more traditional aspects of school work. Radio and TV broadcasts may or may not fit in well with a course at school. And if they suit one school they may not meet the curricular requirements of another unless the organization of school studies coincides either nationally, regionally, or locally with new media organization.

Few of these problems are incapable of fairly rapid solution if sufficient economic resources are made available. The resistance offered by teachers to new media on pedagogical grounds is perhaps more fundamental. Not all of it should be regarded as conservative prejudice. Certainly tradition plays its part. Several authors note that the views of Comenius (now a respectable figure) have long been accepted among educators in their country. Newer forms of illustration are less readily

welcomed, often because they were first developed as forms of entertainment. Against the introduction of visual and aural aids is the view, held by many teachers, that learning should not be made 'easy'. More positively, many teachers call into question the desirability of new media because they destroy certain fundamental conditions under which good teaching and learning take place. Small classes permitting individual attention are regarded as important by most educators. The ideal of personal tutorship has not been lost entirely. New media extend the size of the audience considerably. Furthermore, those who regard the personality of the teacher as important in effective learning argue that new media inevitably depersonalize the teaching process to some extent.

Evidently these considerations are important. Reconciliation of different viewpoints demands of educators deeper and more extended research into the basic educational theories and also into communication theory. It is our hope that this volume as a whole might make some contribution to this important area of educational controversy.

In this section national ideologies concerning learning theory and so on are not given much prominence. Doubtless national policies concerning the organization and administration of new media depend very much on national politics and social theory. In most countries the organization of new media services reflects the general system of educational administration. Nowhere is this contention more apparent than in France, where M. Lefranc points out that "The structure of the services and the organization responsible for the production and the use of visual aids in French education is an exact reflection of the administration found in the general system of education in France". The system represents an important prototype of central ministry control. The advantages of gearing the use of visual aids to a national curriculum are obvious. Equally important are the possibilities of standardizing conditions throughout a country and unifying otherwise rather diverse elements therein.

Somewhat at the other extreme are the arrangements made in the United States. A variety of agencies co-operate in the production and presentation of audio-visual aids to education. The importance accorded to them has, however, been recognized by the Federal government, which made provisions under the National Defense Education Act of 1958 for support to be given to new media developments. Nevertheless, in principle control is regarded as a local affair and local, together with private, enterprise thought to be the best way of promoting educational progress. In this framework much support is given by the philanthropic foundations. Many universities and other educational institutions run their own radio and television stations. Typically the use of new media,

principally as entertainment, has taken place under the impulse of commercial interests. In Japan too much of the development has been through the investment of private capital.

The United Kingdom, Australia, and the Scandinavian countries have tended to combine central (or regional) government control with a good deal of private freedom. National committees serve as advisory agencies. A detailed account is given of Indian developments in the organization and administration of audio-visual aid services.

Under the various policies of control it is possible to gain some idea of the extent to which new media are utilized in education in various countries. In Poland and Denmark there has been, it seems, a certain reluctance to use them, or at least some of the new media. Professor Volpicelli indicates that the rather limited provision of school broadcasting facilities in Italy stems partly from the reluctance of teachers to accept them and partly because of the economic conditions of the country. In every case, of course, economic circumstances help to determine the extent to which new media services can be used. The establishment of radio and television services involves considerable capital; running costs might, however, be relatively modest compared with the running of an educational system well staffed with competent and highly trained teachers. Similarly, cost enters into the picture in the case of rural areas. Often these areas can only maintain single teacher schools which inevitably lack the resources of larger urban schools. Many of the efforts in Australia, Sweden, and the United States are designed to equalize as far as possible educational opportunity.

Many questions remain unanswered. Few contributors seem entirely satisfied with the situation in their own countries and all of them recognize that the introduction of these services, designed in many cases to meet special problems, raise others. Control of the media is obviously important, and closely connected with it is the question of capital investment. Developments in equipment are, of course, likely because of the entertainment industry. But who is to promote the production of films, television programmes, and the like which are specifically intended for the classroom? And what agency, if any, should regulate the content of the programmes? The possibilities of particular power groups using new media for their own ends are apparent. The brief account given by Professor Bohlen of the uses to which radio was put during the National Socialist régime points to the obvious danger. In schools at least, the teachers intervene between the information supplied and the pupils. Teachers therefore need training not only in the use of these aids but in the important implications of such a use for society.

THE EDITORS.

CHAPTER ONE

Growth in the use of Mass Media in American Education

IMPORTANT and dramatic changes are taking place in American education as a result of modern technical advances in communication. Over a period of four decades the use of motion-pictures and radio has shown constant growth, and more recently the advent of television has marked the beginning of a new phase in the use of mass techniques of communication in the schools.

Motion-Pictures

As a result of the extensive use of motion-pictures in the military training programmes during World War II, there was a sharp rise in the use of films in education, followed by continuous growth. National surveys conducted by the National Education Association in 1946 and 1954 revealed that the number of sound motion-picture projectors in the schools as compared with pupil enrolment had increased 140 per cent during the eight-year interval between the surveys.¹ During the same period, the relative number of sound motion-picture titles owned by the schools had more than tripled.

In a more recent survey conducted by the U.S. Office of Education, it was found that over 500,000 films are housed in 1,009 16-mm. film libraries operated by educational institutions or agencies.² Another 2,651 16-mm. film libraries are operated mainly by public libraries which also render important services to the schools. Further recent information gathered by John Flory and Thomas W. Hope indicates that an estimated \$21,000,000 was spent on educational films in the United States in 1958 alone.³ As of January 1st, 1959, 7,900 motion-picture titles were available for primary or exclusive use in education; 4,770 of these were produced by commercial producers, whereas most

¹ *Audio-Visual Education in Urban School Districts, 1953-54*, National Education Association Research Bulletin (Vol. XXXIII, No. 3, October 1955, Washington, D.C.).

² Seerley Reid, Anita Carpenter, and Annie Rose Daugherty, *A Directory of 3,660 16-mm. Film Libraries*, U.S. Department of Health, Education, and Welfare (U.S. Government Printing Office, Washington, D.C., 1958).

³ John Flory and Thomas W. Hope, "Scope and Nature of Nontheatrical Films in the United States" in *Journal of the Society of Motion Picture and Television Engineers* (June 1959).

of the remainder came from the producing units of more than eighty colleges and universities. The number of educational motion-pictures produced in the United States in 1958 was approximately 500. A further indication of the extent of use of motion-pictures in education is given by the estimate that 189,300 16-mm. sound film projectors are owned by educational institutions. It is believed that about 95 per cent of the secondary schools and 80 per cent of the elementary schools now own one or more motion-picture projectors.

Television and Radio

Eleven new educational television stations began operation during the fiscal year 1958-9, bringing to forty-three the total currently on the air. At least eighteen construction permits were pending early in 1959, and many other possible stations were in early stages of planning. The dramatic quality and far-reaching effects of recent developments in educational television are symbolized by the Educational Television and Radio Center, a non-profit private organization which serves as a network outlet for educational stations. This national distribution centre makes it possible for local stations to draw upon the programme resources of other stations throughout the nation. State educational TV networks exist in Alabama, Florida, Georgia, and Oklahoma. At least two regional networks are now contemplated. Nation-wide educational broadcasting was initiated in October, 1958, when a course in modern physics taught by Professor Harvey White of the University of California was offered on a coast-to-coast network using the facilities of the National Broadcasting Company. This course was offered at an early morning hour by about 250 colleges and universities, and was viewed by thousands of physics teachers, college and high school students, and others. The total viewing audience was estimated at 300,000 persons. A course in modern chemistry is now being offered on a nation-wide network.

The scope and effect of televised courses of instruction is enhanced by the fact that the programmes are available for subsequent distribution as films. Even before the Continental Classroom, a complete physics course for high school students had been put on film as it was televised for students in the Pittsburgh area. This course, as well as a chemistry series, now makes available complete courses of classroom instruction on film.

In addition to broadcast television, closed-circuit television has become a very important factor in the instructional programmes of many colleges, universities, and school systems. Early in 1959 about 120 educational institutions were operating closed-circuit television installations. In one public school system in Washington County,

Maryland, approximately 17,000 pupils in five high schools and thirty elementary schools were receiving regular instruction by closed-circuit television originating from studios in Hagerstown operated by the local school district. This experimental programme was entering its third year of operation. Many colleges and universities were accumulating similar experience, and there was considerable evidence of a strong growth trend in this phase of educational television as well as in broadcasting.

In radio, five new educational stations began broadcasting in 1958-9, bringing to 189 the total number of radio stations owned and operated by educational institutions. Evidence of persistent growth in the use of radio in education was given by national surveys conducted in 1946 and 1954 which showed that the number of radio receivers in the schools doubled in relation to the number of students during the eight-year period between the surveys.⁴

Some Deterrents and Obstacles

It should be noted that although the persistent and rapid growth of mass media equipment and materials in the schools might appear to signify maximum use of the new media in American education, no such condition exists. Since World War II there has been a remarkable increase in the use of audio-visual materials of all kinds, but the general utilization of the mass media is still at a level regarded by many as primitive, or at least far below the possibilities inherent in the present stage of technical development and availability of materials. In the 1954 survey conducted by the National Education Association it was found that although elementary and secondary school teachers in general had shown a marked increase in the frequency of use of motion-pictures, there were still substantial numbers who reported they never used films in their classrooms.⁵ Also it was shown that although the number of elementary school teachers who used films "frequently" had increased sharply, from 15 to 35 per cent between 1946 and 1954, the corresponding number of frequent users of films in secondary schools had remained stationary at 24 per cent.

There are still many deterrents and obstacles to the wider and better application of the mass media in American education. Substantial gains have been made and continue to be made in teacher education for the use of the new media, but there are still many teachers who do not have specific or adequate preparation for intelligent and effective use

⁴ N.E.A. Research Bulletin, op. cit., p. 105.

⁵ *ibid.*, p. 115. (19 per cent of the secondary school teachers and 11 per cent of the elementary school teachers were in the "never use films" category.)

proved, calling for the expenditure of approximately \$5,600,000 over a period of years. This is only the beginning of a programme which is presently authorized to continue through the fiscal year 1961-2, and which will undoubtedly call for continued substantial expenditure for research and dissemination of information on the use of the new media in education at the national level.

Some Issues and Contrasting Views

The meaning and importance of Federal support for research in the use of mass media in education becomes increasingly evident as one examines some of the more recent and dramatic developments as viewed against a background of mounting concern over certain critical changes and shortages in the schools. What are the mass media for? What can they really bring about? Should the new media be used to improve education qualitatively or to extend instruction quantitatively? This, of course, is not necessarily an either/or alternative, but roughly it poses a significant question which is troubling many teachers and many citizens who are concerned about the schools.

Serious teacher shortages already exist. In the immediate future, the existing shortages of well-qualified teachers, school buildings, and facilities will become acute. In view of the rapidly mounting population and the present limitations of teacher training institutions and school budgets, it appears that the situation will grow worse before it gets better. Some educators and some laymen are looking to the mass media, and especially to television and film, as a possible way to alleviate the problem of teacher shortages by bringing capable, well-prepared teachers to larger numbers of students. Television, for instance, has been used to teach physics in high schools in sparsely settled areas which do not have physics teachers in most schools.

Many other educators and laymen are deeply concerned about the possible detrimental effects of education conducted on a mass basis. They contend that good learning requires small-group instruction and face-to-face contact with the teachers. Hence they conclude that the answer to the teacher shortage is to train more and better teachers—not to try to substitute machines for human beings in a process which, above all others, requires the direct contact of one person with another.

Still others who participate in the education process, or view it with concern, are searching the possibilities of re-deployment of teaching staff and re-organization of the activities of individual teachers in such a way as to combine the advantages of large and small group instruction where appropriate; to share the special talents of gifted teachers and educational resource persons; to lift the burdens of mechanical and repetitive tasks from the individual teacher; and to think as flexibly

and creatively as possible about the total organization and use of personnel and space in education so as to combine quality, sensitivity, and human warmth with the most economical use of human and physical resources. From this viewpoint, the function of the new media in such re-organization of the instructional process is simply that they open up an endless vista of possible new combinations of persons and technical resources in time and space. We tend to think of the mass media as constantly increasing the size of the audience and the distance between communicants. A more positive view is that the new media give us *control* over the size of the audience and enable us to extend the range of the communicator in time and/or space. (At the same time, the communicator's power to control the stimuli of communication can be vastly increased.) In education, as in any other process, an increased measure of control can be considered a negative factor only if we assume that failure or lack of ability to use the control properly is inevitable, and yet the dark suspicions and misgivings that attend the introduction or expansion of the use of the new media in many educational institutions would seem to indicate just such a pessimistic view.

Several viewpoints regarding the growing use of the mass media in American education have been indicated. Obviously, the resolution of the many issues, doubts, and questions surrounding the applications of the new mass media to instructional problems can be accomplished only if there is a continuing and substantial effort to apply the methods of modern scientific experimental inquiry to these problems. No doubt the universities, the professional organizations, the private foundations, the private industrial organizations, and the various agencies of the Federal Government will continue to play their respective roles in the study of the communication process in education. In the period ahead, the new educational media programme now being carried on by the Office of Education may well become a focal point for the organization of a total national effort to learn more about the use of the mass media in education and to disseminate this information to the schools and to the nation at large.

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Education and the Problems of the New Media in the United States of America

THE introduction of each new medium of mass communication in the United States has created a flurry of research activity. Like the child who abandons his new toy after having played with it awhile, researchers have often forsaken each medium after an initial high interest. Continued research is carried out by a small group of persons dedicated to the audio-visual field. Research appetites are again whetted when another new medium is introduced, but satiety seems to come quickly. The current plaything is television, and already there are signs which point to an abatement of research with this medium.

Some idea of drop-off in research may be obtained from compilations of research done from time to time. In film, the periods of highest output of research articles were in the 1930's and early 1940's. In radio, research titles were most numerous in the late 1930's and early 1940's. The number of published reports has dropped off radically since 1948. This is also true in production and operations. It is too early to see if the same thing will happen to television, but there is no indication that television research will not go the same way as film and radio research.

No doubt sheer novelty of the medium induces a great many people to engage in research, but there are other reasons for decreased activity than the one of mere dissipation of the novelty effect. Before discussing the findings with respect to education and the mass media, a consideration of possible reasons for the falling off of research is pertinent.

In the first blush of enthusiasm, proponents of each medium have advanced claims about the potency of the medium for educational purposes. In large part, these claims have not been supported by research. Instead, research has tended to place the medium in perspective. In most instances, this has been in the form of inability to reject the null hypothesis of no difference between the new medium and conventional teaching. The finding of no significant difference may in itself be significant. The very potency of the medium may lie in the fact that it is not inferior to conventional methods, for it now becomes possible to teach more students at less cost without loss of efficiency. However, findings of no significant difference are probably not dramatic enough to sustain interest in continued research (1).

As so often happens in social research, the findings have been at times applicable only to particular situations and conditions. The failure to integrate research findings into some fruitful theoretical framework no doubt has deterred further research effort. When questions of the order of "I wonder what will happen?" are exhausted, there are no questions ensuing from a theoretical analysis.

Educators have lagged in utilization and adoption of the new media in teaching, even when research results clearly have indicated the gains to be attained when judicious utilization is made. Of course, resistance on the part of educators may come from rabid proponents overselling a technology. On the other hand, there seems to be almost a blind adherence to the traditional educational methods. There is fear that technology will engulf the classroom situation to the point that intimate face-to-face teaching will be destroyed (2). Probably some feelings of threat are experienced by some in which they see that use of the new media will focus attention on good and bad teachers. Even when the advantages of the new media are recognized, sheer inertia prevents utilization. It takes time to prepare new materials, to orient oneself to the capabilities of the media and to take the extra effort to secure necessary materials and equipment (3).

Another factor in the rejection of use, however, may be tied to what one writer has called the "entertainment set". Judgments about the new media are made on the basis of observations of commercial output of these media. This has led to the feeling that some of the pap which teachers have seen will be introduced into the classroom if they use the new media. Thus a means of transmission of information is condemned on the basis of the particular content which has been transmitted.

There is also a noticeable lack of communication between researchers and users and among researchers themselves. Often, pertinent findings have not been brought to the attention of key people so that appropriate action might follow. One reason for this is the lack of adequate outlets for findings in new media research and teaching. Where specialized journals have appeared, such as the *Audio-Visual Communication Review*, the readership is limited to other people of like minds. In other research endeavours, the investigators must try to squeeze into established journals wherever they can. Researchers often find themselves duplicating prior efforts simply because information has not been disseminated widely enough. A prime example of such duplication is the recent work in television with over a hundred studies available comparing television and face-to-face presentations of classroom lectures.

Research Sources

What kind of agency carry out new media research in education? The greatest impetus has been provided by the armed forces. In their mass training programmes during World War II, great dependence was placed on the use of visual aids in teaching (4). Training films, filmstrips, slides, three-dimensional models, recordings were used in great quantity, and more important, integrated research projects were launched to assess various aspects of effectiveness. Interest in the use of the new media has remained fairly high. The second push has come from philanthropic foundations which have provided sufficient funds for educational institutions to carry out necessary research. In universities and colleges some research units have sprung up which are devoted primarily to studying the new media, although a great deal of their concern is upon the impact of the media on cultural values rather than upon strictly formal educational goals (5).

At present, the main source of support for new media research in education is the philanthropic foundation. For example, the Ford Foundation, through its Fund for the Advancement of Education, has encouraged experimentation and demonstration in the field of television teaching. Most of the large projects in television use in education have been subsidized by the Fund (6). The armed forces have continued to support research, although activity has lessened somewhat compared to a few years ago. Most recently the Federal Government, through its National Defense Education Act, has begun to spur research with the new media under Title VII of the Act.

Research and Theory

There is a tendency for such supported research to engender enemies. This tendency has been abetted by certain statements which have been made in dissemination of results. What must be realized is that the presentation of research results alone is not sufficient to persuade. Educators still see a threat from 'gadgeteers' which will in large part discourage the use of the new media regardless of merit. Thus, in terms of wise use of the new media in education on a nation-wide scale, some means of getting educators to view the contributions of the new media from a different perspective is due (7).

We ought to be able to derive such perspective from sound educational philosophy and basic theories of communication. Few of the leaders in educational communication operations and research seem to be working from either. The many pressures for change and development appear to invite expediency and opportunistic manipulation.

Many examples abound where a little thought, a little planning, a little consideration for long-run objectives, a little attempt to synthesize and integrate might have made a vast difference in the fruitfulness of outcome. The teacher, the audio-visual producer, the administrator, the researcher all need to know more about where and when that which they are doing can fit best into a larger system.

We need theory both in operations and in research. Through theory we can simplify our world enough to deal with it more or less sensibly. Perhaps the rest of the world views us correctly. Perhaps we have too much love for activity and too little love for contemplation. We seem to abound in sponsors unsure of what they want, paying money to operators and researchers unsure of what they want, dealing with a great public unsure of what it wants or where it is going—and each group seems to hope the other will somewhere and somehow discover what it wants.

Theory attempts have been made from time to time. Models of the communication process pop up regularly. Perhaps the most familiar statement has been Harold Lasswell's query of, "Who says what to whom and with what effect?" In times past, we have seen concentration upon each of the elements of Lasswell's formulation. Thus, studies of *who* have appeared which asked questions about organization and control of the mass media. Lasswell himself has been a distinguished contributor to the *what* aspects with his work in content analysis. *Whom*, or audience analysis, has been concerned with what kinds and groups of people cluster around each of the media. *Effects* studies have been concerned with how each of the other elements has produced a particular behaviour or attitude change or shaped social patterns. More recently, however, an integrated attack has been launched. Wilbur Schramm has attempted a model using psychological and information theory concepts; Charles Osgood has worked primarily within a Hullian learning theory framework; Elihu Katz and Paul Lazarsfeld have analysed audience inter-relationships from a social psychological approach; and Carl Hovland has studied pertinent variables in the communication process within the experimental laboratory (8).

A melting of educational theory and communication theory is yet to be attempted. Although this approach is fraught with pitfalls, no significant contribution will be made without such endeavours. The state of theory is in its infancy. Perhaps the current fascination in the United States with the term 'communications' will induce more persons to try their hands at research and theory building in order to put this field on a solid foundation.

Research Directions

Each new medium which has appeared usually has spurred research in three general areas. One is the investigation of general audiences and audience characteristics of the medium executed for the benefit of commercial interests, either sponsors of programmes or owners of multi-outlet facilities for the medium. The second is the inquiry into how the output of the medium is affecting members of society. The third direction is the study of how the medium can best be utilized in advancing educational goals. All three directions have produced results which are pertinent to education.

There is usually great curiosity about the extent of coverage of any new mass medium. These figures have very important consequences for sponsors of programmes. Thus, for example, we know that since the advent of television we have had a steady increase in viewing to the point where the average American adult views about thirty hours a week. We also know that over 90 per cent of the population is potentially within receiving distance of at least one television station, and that 80 per cent of all families own at least one set. We also know about viewing habits of school-age children: primary school children view about twenty to twenty-five hours a week; junior and senior high school children view about fourteen hours, and college students view less than ten hours a week (9).

We also know from commercially sponsored research the amount of time spent on other mass media. As Schramm has pointed out, we spend about one-fifth of our waking hours engrossed in the mass media. We have some good ideas of the correlates of exposure to the mass media, and some idea of the effect of different types of programmes.

All of these findings raise questions for the second line of inquiry, the social impact of the media. Questions such as these have been asked with respect to education: Is there a relationship between amount of exposure to television (or radio, or film, or comic books) and juvenile delinquency? What is the effect of exposure to the media on study habits? On school achievement? A few years ago, a congressional investigation was launched on the question of juvenile delinquency and the output of the mass media. Although some writers have insisted that the mass media have directly caused a rise in juvenile delinquency, the question is far from settled in terms of research (10). Although a general feeling seems to exist that because of the pervasiveness of the mass media, and the nature of its output, untoward effects are being produced, no long-range research programme has been launched to investigate this problem thoroughly (11). Indeed, in short-run studies, the answer to the question of exposure and deleterious

effects seems to be in the negative. No particular effect has been found with respect to school grades, study habits, or juvenile delinquency in general. There have been studies, however, which have pointed out that particular social situations are conducive to utilizing the output of the mass media in certain ways among children (12).

One of the difficulties in research with these questions, important as they are for education, is the morass of factors which seemingly affect the situation. It is particularly difficult to find a direct causal relationship between mass media output and particular types of activity such as juvenile delinquency. That research has not been able to present clear-cut evidence should not mean that such research should be abandoned. Indeed, the pros and cons of the merits of mass media output are discussed heatedly even without research evidence, and these discussions may result in decisions which may be detrimental to national well being.

Educators have reacted to the findings of the first two lines of inquiry in several ways. Some have taken an 'ostrich' attitude. That is, teachers have ignored the mass media in their teaching. They expose themselves less to the new media than others and make themselves less capable of sound judgment with regard to output. Another reaction has been to join the commercial practitioners. Thus, educational institutions have established their own radio stations, television stations, and film-producing units. To-day in the United States, there are 204 non-commercial AM and FM radio stations and 40 non-commercial television stations. These figures should be seen in the context of 3,805 commercial radio and 511 commercial television stations.

It would seem that this activity, the establishment of educationally owned new media, would garner the wholehearted support of educators. There are several reasons why this is not so. First, the perceived costs of constructing and maintaining facilities have militated against widespread adoption. We find that almost all of the non-commercial radio and television stations are owned or operated by educational institutions. Although the greatest bulk of their programming is in the field of adult education, many people are not within receiving distance of such a facility, and even when they are, most of them tend to prefer commercial offerings. Second, the operators of the new media in education have been regarded as somehow tainted and not worthy of being called educators. This is part, perhaps, of the 'entertainment set' we spoke of previously. Third, operators in the new media have often turned a deaf ear to research. Where education through the new media might be made more effective by operators if research results were incorporated, we find, instead, a resistance to

research usually in the form of the alleged separation of artistry and science.

Educational Film Research

What has research shown about utilization of the new media in education? We might start with films. Research with motion-pictures was done first by persons in education. Unlike radio and television, commercial film producers were singularly uninterested in any research, perhaps because they could directly assess effects through box-office receipts (13). Educators started during the First World War to assess the educational value of films. To date, film research has been the most active and continuing field of investigation among the new media (14).

There is not much doubt that films can teach. The question becomes how much and how well and under what conditions. In the area of acquisition of information, the area most tested in teaching, films do impart this kind of knowledge about as effectively as conventional classroom methods. When films are used as supplementary material, to augment regular teaching, students exposed to this method do better than those students taught under regular conditions without film. There does not seem to be any general enhancement of learning of materials not covered specifically in the films, however (15).

An often made criticism is that the new media may be successful in aiding acquisition of factual knowledge but may be unsuccessful in developing conceptual thinking, critical ability, or inference drawing. The limited research done with this facet of learning does not substantiate these criticisms. Films are successful in aiding conceptual learning. In some instances, films have been more successful than conventional methods in getting across rather difficult concepts (16).

Loss or forgetting of what has been learned does not seem to be any greater for film than for any other method of teaching. Although loss is tied up with the nature of presentation and type of subject-matter, film research has shown that what is taught over film may be retained for long periods of time without appreciable loss.

Films are also quite effective in teaching motor skills. Watching films about an operation requiring motor skills seems to aid in developing these skills more rapidly than watching a teacher demonstrate in person. Further, this advantage is heightened in the case of teaching complex motor skills compared to simple skills (17).

In the area of orientation training, the influencing of attitudes, the arousing of motivation or the changing of opinion, films are also quite effective. However, change in orientation is a function of several interacting variables. Films are successful in those areas specifically covered

by the film and in areas congruent with the social environment of those exposed. The tendency to accept the change must already be present in the audience in the form of perceived agreement with social values. There is evidence, however, that film is not successful in changing general attitudes. It would seem, then, that if the ground is covered by the film and the content of the film is in line with existing beliefs, films are successful in changing particular attitudes, but that there is very little, if any, tendency to change in any other attitudes which seem to be related. The film, in concert with other mass media, seems to 'canalize' existing beliefs and values (18).

The best condition for learning from films is one in which there is a combined use of methods. For example, student participation methods inserted during the film are notably successful in achieving higher learning. Also successful are the uses made of introductions by the teacher where attention is directed beforehand to particular points. Although higher learning is achieved for these points, general learning from the film does not seem to be enhanced in comparison with films viewed without an introduction. Film teaching success goes up as films are fashioned for specific audiences. If this specified audience is convinced of the usefulness of the materials presented, and if their attention is directed to important points and if a chance for practice or participation is provided, then films do a superior job in teaching (19).

One additional point should be made about films. In comparative research, it has been found that filmstrips and slides can be as effective as motion-pictures. In at least one instance, it was found that making slides of selected frames from motion-pictures and presenting them to students was as effective as using the film itself. This point has far-reaching implications for educators who are somewhat overwhelmed by film costs (20).

Educational Radio Research

Radio research started from the industry itself. Commercial research on radio audiences was emphasized early in radio's history with very little work on the uses of radio for education. Indeed, some of the most notable work in the area of mass communications has been that dealing with the nature, characteristics, and habits of the radio audience (21). In educational research with radio, comparison studies have presaged the now familiar pattern of no significant differences. In comparison with regular teaching methods, radio has taught about as well in subjects tested. Of course, these subjects are those in which aural-verbal skills predominate (22).

A great many studies utilizing radio or tape recordings have been done in the area of attitude change. Although in many instances it

was the desire to control the message to a standardized output which led to the use of radio or recordings, nevertheless the findings are of more than passing significance for education. For example, Carl Hovland and associates have done a series of studies on the factors relating to attitude change and persuasion. Their studies have demonstrated the advantages in having high credibility attached to speakers, in presenting both sides or one side of an argument, given initial position of audiences and educational level, in including moderate rather than high amounts of threatening content. An interesting finding in almost all of these studies is that amount learned, in terms of factual content of the message, is independent of attitude change. These findings hold true for printed as well as aural material (23).

Recently, a great interest has been shown in tape recordings, multiplexing, stereophonic sound, and even in subliminal aural presentation. As yet, research on educational uses has not appeared in great quantity. Some research is reported on the uses of tape recordings in foreign language training. Part of this interest in sound recordings and foreign language teaching stems from an increased interest in applicability of principles derived from the discipline of descriptive or structural linguistics, a field heretofore relatively ignored in language teaching. The research shows that total teaching in languages may be carried out by radio or recordings alone. As a supplement to regular language teaching, radio or recordings can be used as an adequate substitute for a native language speaker.

Educational Television Research

Television research is the most recent area to be exploited. The first studies, as in radio, were studies of the social impact of commercial output. This has been overshadowed, however, by commercial research intended to answer specific questions about nature of audiences for television sponsors and networks. The latter research has produced numerous estimates of numbers of viewers for specific programmes, and has at times threatened to become the sole criterion upon which sponsors base continuance of their programmes. Surprisingly little has been done on the content of the programmes (24). In studies on the social impact of the medium, some attention has been paid to exposure of school children. Generally, the results of studies of exposure show very little effect upon school activities. There is some indication that those who expose themselves most are somewhat higher in intelligence (25). What the long-range effect of exposure will be is still a matter of conjecture. It is generally agreed, however, that the conditions which face the teacher to-day in education are complicated by the ubiquity of the mass media (26).

Teaching by television has been the subject of a great deal of research in the past five years. In most instances the research has dealt with the total teaching situation, that is, a complete substitution of television teaching for conventional methods. In almost all of these studies, across a wide variety of subject-matter and students, the finding has been one of no significant difference between television and conventional instruction (27). We would expect that the findings from film research would be directly applicable here; however, there is scant evidence of researchers relying upon what has been learned from about forty years of film research.

The pattern of no significant differences has been broken here and there by research reports which show face-to-face teaching as more effective than television teaching. These may be the result of the nature of statistical outcomes. These also may be due to not utilizing the television medium to advantage. The outcomes may be the result of better tests and better procedures in executing research. A suggestive finding is the one in which face-to-face superiority evinced itself in the second term of televised courses. We may be dealing with a novelty effect such that, in the long run, television will prove inferior to face-to-face methods (28).

Almost as consistent as the findings showing no significant differences has been the finding about acceptance of television by students and teachers. Teachers have been quite negative. Acceptance has been slow, although the prospect of foundation grants to support television projects has lured many educational institutions into starting television activities. It is interesting to note that the most avid supporters of television among teachers are those who have either taught over the medium or have been exposed regularly to television teaching. The hard core of resistance, however, comes from those who have not exposed themselves and probably will not expose themselves to examples of television teaching.

Students are mixed in their acceptance of television. Generally, acceptance is higher among primary school children than secondary school children. In turn, both are higher than college students. The highest acceptance comes from adult education students, those who have terminated their formal education. A great potential of educational uses of television lies in the servicing of adult education students (29).

Interaction between acceptance of television teaching and acceptance of the instructor is apparent. In several studies, choice of whom the students thought was a good instructor overrode preference for teaching by either television or conventional methods. So far it is not

known what additional qualities, if any, make for an effective television teacher.

That quite a few students have been taught by television is clear. At the university level, some 500 courses have been given solely by television. At the primary and secondary school level, countless enrichment programmes have been carried out. In one project involving thirteen school systems in 1958, over 40,000 youngsters were taught some of their courses by television (30). Another programme, an elementary physics course over nation-wide television at 6.30 in the morning, attracted 5,000 credit students and an estimated 270,000 regular viewers. In addition to these open-circuit broadcasts, at least 133 closed-circuit systems have been installed and are being used in some cases for teaching courses (31).

It would seem that television teaching will become widespread and break through in education where films and radio have not. However, it is noteworthy that almost all of the television teaching efforts have been foundation supported. What will happen when foundations withdraw further support is not clearly known.

The Use of Research Results

What are the implications of research with the new media? It has been amply demonstrated that students can learn when course content is transmitted other than by face-to-face means. The findings of film research have been with us for a long time. The mounting evidence in the case of television seems to indicate that the means of transmission may have very little to do with learning on the part of students. If this is so, then there are clear advantages in utilizing the new media for specific educational purposes. The teaching of factual information, where the teacher functions solely as a reporter, might be taken over by films or television presentations. This would free the teacher to devote more of his time to individual guidance and consultation with students. In face of rising enrolments in the United States, some means of increasing individual contact must be considered.

However, the spectre of teacher resistance is ever before us. There is evidence which says that teachers pay lip service to the value of audio-visual aids but not much beyond this (32). Although high usage figures for the new media are reported in some instances, a very few teachers account for the bulk of the use. Some new approach is needed beyond trying to inculcate the value of aids to teaching through required courses in education curricula. All of the research findings will go for naught if proper utilization cannot be made.

One factor in utilization is availability. Availability not only refers to adequate facilities close at hand, but also refers to ease of use in

specific situations. There are some teachers who might be willing to try audio-visual aids in the classroom as a test case. It takes very little to touch off negative attitudes. This may be caused by equipment not arriving on time, a breakdown in equipment during use and a host of other such minor points, yet the single case may be enough to create hostility. Educational institutions which have co-ordinators for the planned use of the new media are notably more successful in getting widespread and wise use. It goes without saying that the co-ordinator's job is a very delicate one, wherein he must show the added educational benefits of utilization of the new media but avoid being labelled an over-zealous gadgeteer.

The direction of research with the new media is one in which aspects of adaptation are being investigated. There has been a continued effort to swing away from testing acquisition of factual items of subject-matter towards that of testing for the impact of the new media in aiding critical thinking, in forming course related attitudes, the so-called intangibles which educators always talk about. Our prior comments on theory need reiteration here. There is an overwhelming sense of futility when one tries to organize research on the new media into some meaningful framework. Studies are discrete, disparate, non-dependent on other research and exist as data awaiting theoretical formulation. The need is very great for adequate theory to guide producers and operators in the new media. There is no doubt that practical and demonstration research is needed, but we believe the eventual pay-off is theory. As the late Kurt Lewin put it, "There is nothing so practical as a good theory".

The Future of the New Media

In the United States the relatively calm, slow-moving, predictable rural way of life has changed. We have moved to the city and we are dependent upon each other as we never have been before (33). The new media, like their contemporaries among the inventions of our time, have moved in both to simplify and to complicate our lives. They give us the chance to learn more rapidly about a great deal that goes on beyond our direct and immediate environment. But by doing so they seem to pose problems not realized or not there before.

The media themselves are instruments. But what they come to mean to us derives mostly from 'who uses them in what ways for what purposes'. Much of the criticism and defence of the 'mass media' is befogged by failure to clarify the intents of the people who pay the money, the people who create messages, the distributors, etc. If one is in the business of selling soap, he usually wants to sell his soap more rapidly and more surely than all his competitors. If one is creating

dramatic programmes to help somebody to sell soap, he creates the kind of programme which will attract soap buyers or he does not stay in business very long.

Teachers may be unhappy about the proportion of waking hours their students spend watching television, listening to radio programmes, reading comic books, or going to the movies. Adult educators may see the mass media as evil competitors against their fine educational television or evening classes (34). Entertaining shows may indeed pull us away from serious instruction. We want to relax sometimes, to sit enchanted in the wild winds of fantasy. Does this then mean that we are pawns, drawn into the commercial dream world, like drug addicts our sense of discrimination falling away? If so, it seems to us, the human race would have vanished long ago.

Living demands learning. In and out of school we learn as we strive to strengthen our hold on things and people. So why has the teacher to worry about 'competition'? If there is 'competition', how so? Is the teacher not helping the student to solve some of his most pressing problems? If the commercial mass media can bring vivid fantasy and the real world home to the student, why can't the teacher make use of this? If the student is inattentive in class, fails to complete his homework, perhaps the teacher and the course are not close enough to his needs. Or perhaps we have all failed to develop his awareness of the intricate and exciting paths along which he may one day have to or want to tread.

If used properly, to-day's media could enhance the work of the teacher tremendously. But in order for this to come about, we need to introduce well-planned automation into the facilities for teaching (35). When this is done, the teacher will be able to wave his magic wand and command the latest and best film clips, slides, and other aids into his classroom. The student will be able to go to the library and press buttons like those on the juke boxes he now presses in order to obtain books, recordings, films, video-tapes. If pay television comes to pass, the adult who wants to learn a new subject or take a refresher may be able to dial it on his television set and pay for it on the spot. But the need for easy information retrieval becomes more and more pressing. We cannot expect the already overworked teacher, the harassed student or the untutored adult who has the urge to learn, to thread his way through to-day's intricate, unpredictable mazes of audio-visual instruction.

Nowhere do we come very close to meeting our present potential. Perhaps we need to set up conditions which will encourage the creative, the imaginative, and at the same time provide adequate tests for the ideas which are developed. Why not develop in education more

laboratories of the kind typical in automobile and airplane manufacture? Why not have School X-15 as we do Pontiac X-3 or North American Fighter X-17? Let us encourage some of our educational wizards to try to envision the best possible systems and construct our clay models and then our small working models. Let us use our limited knowledge of communication-learning processes to put together experimental schools and adult educational systems. The place of the new media in such experiments is the enhancement of the basic function. Doing this will require careful, thorough analysis of our value systems, the educational objectives they imply, teaching-learning functions, and the capabilities of the old and new and even the future instruments we may have.

Let us try to illustrate on a small scale what we mean. It used to be that a speaker delivered his lecture from notes or by reading a prepared script. As various new media came in the speaker was enabled to illustrate his lecture with pictures, maps, charts, and movies. But often these were clumsy to use. Only the highly skilled speaker with competent assistants could integrate such things so that the whole presentation would flow smoothly. Recently a company has developed an automated lectern. It has a prompter roll whose speed can easily be controlled by the speaker. The speaker can programme his whole presentation, including all visual aids, in the same manner that a statistician programmes an analysis through one of the new electronic 'brains'. Every training aid will enter at the proper moment. Such a presentation takes good planning, but once planned it can be extremely effective and at the same time allow the speaker a great deal of freedom. Thus, much can be done to enrich a programme while making even easier the performance itself. We need more comprehensive control devices of this kind at the gates of our educational channels, so that we can take advantage of the vast stores of lively materials available to us—but not yet available enough.

Much of our research and activity has been trivial and unimaginative. It doesn't have to be so. Simply pouring vast sums of money into tryouts and research studies in the new media will not in itself help very much either. It will not help much until some more general and basic educational problems are nearer solution, something to give us guidelines to proper uses of the new media and to vital questions we might ask in our research.

For example, isn't it rather silly to ask again and again the question as to whether a classroom lecture gives students more factual information directly or with the television chain between teacher and student? Isn't it silly to polish up the mechanics of some instruments which are about to be relegated to the junk heap anyway? Instead, perhaps we

should start from more general considerations. Given the basic problem of conveying facts, of relating them through integrating and synthesizing propositions, of teaching people how to make effective use of them in their everyday lives, of demonstrating the enjoyment one can derive from learning, what kinds of sensible schemes can we work out on our drawing boards? Such schemes might suggest all sorts of important hypotheses to be tested by research.

As we talk with people from many countries of the world we find that they, too, are much concerned—fearfully about what is being done through the new media and hopefully about what might be done to destroy ignorance among their compatriots. They, too, are exploring the new media to see how they might help in making people ready to meet the ever-growing demands of the world about us. Basically, many of these problems are very similar from one country to another. Here there is a fertile field for co-operation in research and development of new educational approaches using the new media.

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NOTES

(1) See, for example, C. F. Hoban's discussion in "Hope and Fulfillment in ETV Research", *Audio Visual Communication Review* (1958), Vol. 6, pp. 165-71.

(2) Journals such as the *Bulletin* of the American Association of University Professors often have carried such complaints. See, for example, E. Earnest, "Must the TV Technicians Take Over the College?" (1958), Vol. 44, or M. Chiapetta, "From TVA to TVU", *School and Society* (1956), Vol. 83, pp. 75-8, or Betty Levin, "Television and the Schools", *Harvard Educational Review* (1950), Vol. 20, pp. 255-70.

(3) For discussion of such problems, see M. May and A. A. Lumsdaine, *Learning from Films* (1958, Yale University Press), Chap. 21.

(4) Some idea of the scope of such studies can be obtained from C. I. Hovland, A. A. Lumsdaine, and F. Sheffield, *Experiments on Mass Communication* (1949, Princeton University Press).

(5) Some of these units are the Communications Research Center, Michigan State University, the Institute of Communications Research, University of Illinois, the Institute of Communications Research, Stanford University, the Bureau of Applied Social Research, Columbia University.

(6) The Fund for the Advancement of Education has supported and is supporting such projects as the closed-circuit instructional television research project at Pennsylvania State University, the closed-circuit project of the Washington County public schools in Hagerstown, Maryland, the open-circuit studies at San Francisco State College, at Chicago City Junior College, and most recently the National Program in the Use of Television in the Public Schools, which include thirteen school systems across the country.

(7) This problem has been the concern of audio-visual specialists for quite a while. Cf. W. H. Allen, "Research on New Educational Media: Summary and Problems", *Audio Visual Communication Review* (1959), Vol. 7, pp. 83-96.

(8) Vide: W. Schramm, *The Process and Effects of Mass Communication* (1954.

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(16) Cf. P. J. Rulon, *The Sound Motion Picture in Science Teaching* (1933, Harvard University Press).

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(31) Joint Council on Educational Television and the Committee on Television of the American Council on Education, *Closed Circuit Television Installations in Educational Institutions* (1958).

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Symposium on Mass Media in the United Kingdom

IN the last twenty years there has been a marked acceleration in the use of a wide range of aids to learning in school; teachers no longer confine themselves to the blackboard and the textbook. They use the mass media—film, radio, slides, filmstrips, and museum materials—freely, as the authors of the following three articles describe. It is significant that these tools are invariably regarded as facilities which teachers use in order to increase the quality and variety of experience the children can enjoy. Educational interests are preserved and safeguarded in the case of the mass media, by consultative machinery operating at the centre of production. In addition, no one at the centre of authority has directed that these materials shall be used. In the main, teachers have been persuaded of their value through sheer quality, though quality alone would not have won the day. The swing towards less rigid procedures in the classroom which the use of these materials entails is an aspect of a more general trend in education, evidenced by such things as the introduction of social studies, a freer interpretation of the curriculum, and a greater emphasis on the arts. Important, too, are the technical advances; projectors are sturdier and easier to manipulate, radio extension speakers can be installed in all classrooms, museum materials are better packaged, preserved, and transported. These improvements have made it easy to use the mass media; when ease of use is supported by good quality, teachers who are free to do so will always use the best they can find in order to enrich and enliven their work in the classroom.

Of great interest is the increased use of the museum and its services. It reflects the newer attitude towards schooling, adopted particularly by teachers in secondary modern schools. Educative experiences are to be found outside the classroom as well as inside it and the environment is an important aid to learning. Films and broadcasts bring the world into the classroom, but the museum has helped to bring the classroom out into the world.

HELEN COPPEN.

Films and Filmstrips

IN 1925 the Psychological Research Committee appointed by the Commission of Enquiry published their report by Professors Spearman and

Burt on the value of the film in education. At about the same time the Imperial Education Conference, which was also engaged in studying this problem, reported "that a strong *prima facie* case has been established in support of the view that the cinematograph can be of real value as an adjunct to present educational methods . . . and that it should accordingly be recognized as part of the normal equipment of educational institutions". These reports were to become landmarks in the history of the use of the film in the classroom in the United Kingdom.

The following years up to 1939 were a period of practical experiment and research. Arising from the growing interest of teachers in the use of films, investigations by carefully considered methods were carried out in the classroom by a number of education authorities: Leeds (1929), London (1932), Middlesex (1932), Glasgow (1933), Wolverhampton (1935), and Manchester (1937), to mention but a few. Parallel research was at the same time being conducted in the universities and schools in other countries, and by 1939 the value of film as a teaching tool had been clearly established.

Pioneer Work

By 1937 only 857 out of 30,000 schools had, however, been provided with projectors—a slow rate of progress attributable largely to the inadequate supply of suitable films. The history of the production of films specifically for teaching purposes, apart from the work of a few individuals, goes back to the early 1930's, the pioneers in the field being Gaumont British Instructional Films, the Scottish Film Council, and one or two private ventures like the Dartington Hall Film Unit. This early work, and especially the comprehensive experiment carried out by Gaumont British between 1934 and 1939, demonstrated three things: first, that films for teaching were needed and valued by teachers; secondly, that educational advice was needed in the production of classroom films; and thirdly, that their production was wholly uneconomic. In production there was in fact a vicious circle: too few projectors to enable films to be produced commercially, too few films to justify authorities in equipping their schools with projectors. By the time that war broke out in 1939, production had decreased alarmingly.

The war brought an immense increase in the use of the film, as a means of general information and propaganda on the one hand, and of specific instructions for the armed forces on the other. These needs and developments were correspondingly reflected in the increased production and supply of projection equipment. The practical results achieved led to a very greatly increased degree of awareness, both

among the general public and in official circles, of the importance of the film as an instructional force.

Post-War Development

The next important step was in 1946, when the local education authorities and the teachers' organizations in England and Wales established the National Committee for Visual Aids in Education. This advisory body, financed by contributions from the local authorities, was responsible for educational policy, the collection and collation of teacher opinion, and the provision of information and advice on and promotion of effective methods of using visual aids. Two years later the Ministry of Education, in conjunction with the local authorities, established the Educational Foundation for Visual Aids, responsible for implementing the policy of the National Committee, particularly for production and distribution. This is the national machinery as it exists to-day, although during the intervening years there has been a growing integration of function between the National Committee and the Educational Foundation.

The national organization for visual aids is not therefore a part of the central government. It reflects the pattern of educational administration in the country, for which the primary responsibility rests with the local authorities. The National Committee is essentially teacher-based, and is greatly assisted in its work by the Teachers' Visual Aids Groups, of which there are about two hundred in England and Wales. These are voluntary groups of teachers who meet to appraise material, consider practical methods of use in the classroom, take part in and organize courses and advise on future productions. These Teachers' Visual Aids Groups are an essential part of the national machinery, and make an important contribution in ensuring teacher representation and development of the medium in accordance with the needs of education. In Scotland a somewhat similar development has taken place with the establishment of the Scottish Educational Film Association with broadly the same functions as the National Committee.

Increased Use of Film

The last few years have shown a substantial expansion in the provision and the use of films in the schools. Over 11,000 schools are now equipped with projectors, compared with about 2,000 in 1949. This provision is almost entirely of sound projectors.

The Educational Foundation prepares catalogues of all films and filmstrips which have been made specifically for teaching purposes. They contain about 6,000 entries with an objective summary of the content

of each item. These are distributed widely to schools and are re-edited at frequent intervals.

The Foundation Film Library holds copies of all films and filmstrips described in these catalogues. They are available to schools, and the increasing use which has been made of these facilities is indicative of the expansion in visual aids. In 1949 the Foundation Film Library sent out 1,300 films; by 1958-9 this had increased to 60,000. Moreover, about sixty local education authorities have established their own libraries and these have shown a similar expansion. With schools also obtaining films from commercial libraries there can be no doubt about the wide and increasing use which is being made of the film as a teaching aid.

New Productions

For the production of new films the National Committee, with its teachers' groups throughout the country, has evolved satisfactory machinery for determining the needs of the schools. Recommendations for new films from teachers' groups and individual teachers are collated by the National Committee and given priority. When an idea is accepted for production, an educational adviser is appointed by the National Committee. The qualifications of the educational adviser are that he (or she) should be a practising teacher of the age-range for which the production is intended. The adviser may or may not be a subject specialist and it is not uncommon, with specialized productions, for a subject expert to be called in alongside the teacher adviser. Production is carried out by a commercial company and is financed and controlled by the Foundation.

Teachers have, in fact, realized that children as a whole learn through the eye, and many grasp knowledge far better when it is presented visually than by verbal methods. In this approach to teaching the ciné film makes a unique contribution by virtue of the nature and scope of the medium. It reproduces movements involved in physical processes or actions, and these can be repeated as often as the teacher wishes. By means of modern techniques such as slow motion, time-lapse photography, microcinematography, or animated diagrams, the film can show what cannot otherwise be seen or demonstrated by any other method.

The power of the film to give children an experience of reality, to bring the outside world into the classroom, or to express abstract concepts in concrete terms often makes its use far more effective than other techniques of teaching. The film can also save classroom time by putting over a topic quickly and clearly. The moving medium appeals

to children; it arouses and stimulates their interest; it compels attention and provides a satisfying aesthetic experience.

Moreover, the teacher can use the film as an aid to teaching. He can select particular films to illustrate his course. He can select the time of showing and repeat when necessary. The film is entirely under his control, which enables him to adopt its use to the needs of his pupils.

The Filmstrip

The filmstrip, as the modern method of projecting still pictures, is essentially a post-war development in the United Kingdom. During this period its use has expanded enormously. There are now approximately 30,000 filmstrip projectors in the schools and about 4,500 filmstrips covering most of the subjects in the school curriculum are available. The filmstrip projector has almost replaced the lantern with its $3\frac{1}{4}$ in. by $3\frac{1}{4}$ in. slides, and to a considerable extent the episcopes.

The filmstrip owes its popularity primarily to two main factors. First, a good quality and bright picture is obtained from comparatively simple apparatus which is light in weight and easy to handle; secondly, as the filmstrips are cheap enough to be purchased by the school—the teacher does not have to obtain his filmstrip from a distant library—they are available at hand ready for use as required.

Another factor should also be taken into account, namely, the use of daylight projection. In recent years there has been a considerable increase in the use of rear-projection screens which enable projection to be undertaken without blackout. Special screens have been developed to give a satisfactory performance even under difficult lighting conditions, and several thousands of schools are now equipped. Apart from financial considerations this method has obvious educational advantages; it enables pictures to be projected without the interruption in the lesson which the arrangement of blackout often involves; it enables the teacher to teach from the screen facing the class; and it enables the class to undertake written or practical work while the picture is on the screen. The increased use of daylight projection and other factors have led to the use of projectors with high light output.

While in theory this method is applicable equally both to films and to filmstrips, in practice this is not completely true. While daylight projection is satisfactory for some kinds of film, front projection with blackout is preferable and indeed often essential for others. When, for example, the aim of the film is to create an experience in which the class participates, the effect is lost with daylight projection—such films need a large screen and the focus of attention created by projection in blackout.

One of the more recent filmstrip developments is the talkie-strip.

This consists of a filmstrip used in conjunction with a recorded sound track; the filmstrip is synchronized to the sound by moving from one frame to the next, either automatically or manually, at definite points in the track.

Although a number of experiments has been carried out, talkie-strips have been found to have little practical application to classroom use. In practice the sound track provides little which the teacher cannot do as well or better. Moreover, two of the main advantages of the filmstrip are flexibility and simplicity in use and these are reduced in the case of the talkie-strip.

Reference should also be made to the 2 in. by 2 in. slide. Most film-strip projectors can project either filmstrip or slides. The advantage which is claimed for the slide is that the teacher can select individual pictures and their order of projection. He is not therefore limited in his lesson to the content and prescribed order of the filmstrip, and can build up his own series of slides to suit his own purposes. Slides are therefore being used; the slides may be individually shot or made from frames taken from filmstrips and mounted. This involves additional cost and problems of storing and filing—this at least partly accounts for their limited use compared with filmstrips.

Conclusions

It will be evident that both films and filmstrips are now being used widely and increasingly in the United Kingdom. The two media are complementary and not competitive—each has its own contribution to make, the one dealing with static and the other with dynamic presentation. Both media are developing. Recent developments show that, valuable as it is, we must not think only of the didactic and academic type of teaching film—we must not think of it only as a blackboard extension bound within the framework of a rigid curriculum. If we do, we miss some of the essential qualities which only the film can give. A good teaching film should be a good film, using the full potentialities of the medium, and not ignoring the contribution which the medium can make to visual excitement and motivation.

The crux of teaching is the relation between the teacher and the pupil. The value of films and filmstrips is not only that they bring unique visual presentations to the classroom, but also that they are under the control of the teacher to be used by him in the process of learning. They form an integral part of the lesson—to be used when needed and repeated where necessary. They are teaching aids in the true sense of the words.

J. A. HARRISON.

Museum Services for Schools

By their very nature, art galleries and museums are treasure houses capable of making a great contribution to the educational system, yet it is only within comparatively recent times that their real importance has been appreciated. Official interest was expressed in the 'thirties in several government reports, such as *Museums and Schools* (1931)—a Board of Education pamphlet advocating a greater use of museums by the schools and recommending the presence of teachers in museums for this purpose. On the museum side there appeared the authoritative report by S. F. Markham, *Museums and Art Galleries of the British Isles* (1938). In this report, which covered the whole field of museum activities, Markham did a great deal to awaken the curatorial mind to the educational responsibilities of the modern museum, particularly towards the schools.

In his inquiries, Markham found that of the approximately 800 museums and art galleries in the United Kingdom, nearly 400 received visits from school parties and of these about 150 made arrangements for the parties to be accompanied by a curator or member of staff. Eighty museums had some form of loan service for schools. Only at a few places, such as Manchester, Leicester, and London, was there some form of planned co-operation between museum and education authorities. It is to this type of organized scheme that the term Schools Museum Service is applied.

The Growth of Museum Services

Despite the many difficulties confronting education, notably the shortage of teachers, such services have been increasing in number. A report *Museum and Young People* (1952), prepared for the International Council of Museums, lists thirty-seven museums in Britain making a special feature of work with children, about half of the number possessing a full-time organizer for the purpose. Full information about the position to-day will be provided in a register which has been prepared by that section of the Museums Association known as the *Group for Children's Activities in Museums*. The very existence of such a Group—now some seven years old—of people actively participating in museum education, speaks for itself. From the returns to a questionnaire it would appear that there are now twenty-five organized museum services operating throughout the country.

In the short space of this summary it is impossible to discuss the organization of museum services from the points of view of administration, finance, staffing, etc. It is sufficient to realize that they follow no fixed pattern and the character of each depends on a variety of

circumstances, such as (a) the area in which the service is situated—urban or county; (b) the presence, or otherwise, of a good museum in the area, and the hinterland of school population able to use the museum; (c) the size, scope, and quality of the museum collection and the facilities offered for instruction; (d) the degree of interest and practical support forthcoming from the local education and museum authorities. The importance of this last point should be stressed, for the terms of the organizer's appointment; the staff made available, teaching, technical, and clerical; the accommodation and equipment, and the money allocated to the service are ultimately a matter for decision by the local authorities. Before leaving this theme it would be fair to sum up by saying that the major cost of operating museum services is now being borne by education authorities, and this is what was originally intended.

Schools museum services fall roughly into two main types. The first encourages the visit to the museum of school classes for lessons and lectures on subjects illustrated by the museum collection. Tours of the collection also come within this category. The second is concerned with providing the schools with a loan scheme of museum objects and other material for use at lessons in the school itself. It takes, as it were, the museum to the school. In actual practice, many of the larger services perform, with varying degrees of emphasis, both of these functions, besides catering for school children in other ways, such as providing voluntary classes in the children's leisure hours and staging special exhibitions for children.

The organization of loan services is now well known—the preparation of portable cases illustrating subjects of a museum character, the issue of a catalogue of 'items available' to the schools and the delivery and collection of the cases at stated intervals. The quality of some of the prepared cases in these schemes is of a very high order, and must indeed be a great asset to the teacher giving the lesson in the school classroom. There is a tendency, however, for such services to widen their range of aids to include models, wall charts, diagrams, photographs, filmstrips, films, and gramophone records until they become general providers of visual aids and tend to lose their original museum character. Markham foresaw this in his report when he drew a distinction between the type of aid which he thought should be covered by education authorities and the type of material which could be obtained only from museums. In actual fact, in many of the larger lending schemes sponsored by education departments, the distributing centre need not necessarily be in a museum but can be in a branch of the education office itself. On the art side, most loan schemes provide

excellent prints of the old masters and some modern paintings, and some circulate also selected original paintings.

Visits to Museums

Educators would agree that the greatest value to the children is to be gained from the class visit to the museum whenever this is possible. Not least among the many reasons is the fact that the visit to a good art gallery or museum is itself an aesthetic, cultural experience which can impress the children in such a way as to affect their future lives. Further, in making the children appreciate the social structure of the past upon which present environment depends, the museum has no equal. A third point to be remembered is that the 'subjects' of the school curriculum fall into their proper places at the museum and are seen simply to be aspects of the larger story of man's evolution. A last and very obvious argument for instructing children at the museum is that in such surroundings most children are in a very receptive state. Education is an exciting experience where the child absorbs information rather than is taught.

It is incumbent upon the museum service to exploit all these advantages. Tours of the collection should be welcomed at all times, but by consultation between the museums service organizer or the teachers stationed at the museums and the visiting class teachers, a more scholastic use of the museum is possible, and this adds to the interest without marring the enjoyment. The museum lessons can play an active part in supplementing the school curriculum, e.g. the armour section should be used to give vitality to history lessons from the Norman Conquest to the Civil War and later; the ethnographical section can give reality to geography that a printed page could not achieve; the engineering section is a unique textbook for an understanding of the inventions and machines which brought about the Industrial Revolution and subsequent developments. The importance of introducing children at an early stage to great paintings, sculpture, and fine craftsmanship in all its forms need hardly be stressed, and the art gallery has a great opportunity and privilege in this respect. For the purpose I have in mind it is best that school classes should attend the museum for a course of lessons, one per week or fortnight during a school term. Despite difficulties of dislocation of school time-table, travel, accompanying staff, etc., experience at Glasgow and elsewhere has shown that this is quite feasible.

Most museums engaged in the instruction of school classes now provide adequately equipped classrooms. Objection has been made to this practice by some who think it is wrong to take the children from the school classroom in order to spend their museum visit in another.

This, to my mind, is erroneous, for it is much easier to capture children's attention in controlled surroundings. The museum classroom also is no ordinary one, for objects relevant to the lesson are on display, while the walls are covered with charts and other illustrative material. The classroom also provides an opportunity to use other visual aids to the full—slides, filmstrips, and film—so that, beginning with the three-dimensional museum material and supplementing it with the two-dimensional, the technique of museum teaching is visual education at its very best. The visit is so arranged that after the lesson the children have ample time to explore the relevant part of the collection, and armed with questionnaire or 'quiz' sheets, corroborate from their own observation many of the points dealt with in the lesson. Many make drawings of objects mentioned. Certain services, I believe, tend to reverse the procedure and follow a project plan where the child begins by finding answers to carefully prepared questionnaires. Some services use both methods.

Museum education such as I have been describing is particularly possible with children from primary schools and is invaluable with children from special schools, especially the deaf and partially deaf. It is also an ideal form of training for the 'non-academic' pupils of the secondary modern or junior secondary schools. Senior secondary or grammar school pupils, with their involved time-tables and examination system, naturally find it more difficult to visit the museum, but a good service can attract them to make occasional visits by providing special lectures or demonstrations, even if these have to be held outside school hours. Better transport facilities, such as the provision of a special bus to take visiting classes to and from the museum, would do much to encourage a fuller use of the museum by the schools at all stages.

Space prevents my enlarging on the part museum services can and do play in catering for children's leisure by providing such facilities as Junior Naturalists Clubs. In addition lectures are given to students of teacher training colleges and of art colleges, industrial employees and indeed the public, in the field of adult education. In this way many of the large municipal museums are fast becoming the cultural communal centres they should be, and this is largely the result of a realization of their educational obligations.

Let me conclude by referring to what may prove the most important step forward in mass media of instruction to-day—television. The possibilities of using museums in this connexion are already realized, but only the fringe has been touched upon and the part which will be played by museums in this new form of communication is likely to be very great indeed.

SAMUEL THOMPSON.

School Broadcasting in Sound and Television

THERE have been school broadcasts in this country continuously since 1924. The British Broadcasting Corporation began experimenting with them almost as soon as it came into existence. A small regular service grew slowly but steadily during the early years and was the foundation of rapid wartime developments. By 1945, altogether thirty-two separate series were being broadcast to 14,000 schools. Since then the audience has more than doubled (now over 28,000 schools) and the B.B.C. at present provides fifty-five series of sound broadcasts, which include special series for Scottish and Welsh schools as well as the main provision for the United Kingdom as a whole. This is by far the largest single school broadcasting service in the world.

The B.B.C. were also the pioneers in television school broadcasting, beginning with a small closed-circuit experiment in 1952, and following this up five years later with the first experimental service for the whole country with the active co-operation of more than half the local education authorities. Associated-Rediffusion Ltd. had meanwhile started another service in the South and Midlands, and in several parts of the country there are now two separate services for schools. Altogether, so far about 850 schools have television sets. The B.B.C. and I.T.V. each offer one programme a day (excluding repeats) to secondary schools, and there are soon to be further programmes for other age ranges.

The figures already given show that at the present time five times as many different school programmes are broadcast in sound as in television to about thirty times as many schools. Though school television is developing fast and commands the greater public attention, the major part of school broadcasting for some time to come is likely to be in sound. As the B.B.C. still has the monopoly in sound broadcasting and provides the only school service with a national coverage in television, this article will deal essentially with B.B.C. school broadcasting. This is not at all to disparage the part played by I.T.V., reference to which will be made when it seems useful to note significant differences or similarities.

The Purpose of School Broadcasts

The most distinctive characteristic of both television and sound broadcasts to schools in this country is that they are *broadcast* (no closed-circuit systems exist here), and that they are broadcast over wide areas by systems either of national monopoly or of very large-scale commercial enterprise. They are therefore backed by rich central resources which are made available through them to the schools. The

B.B.C., which broadcasts some three million words a year to schools alone, must be the greatest single provider of educational material in the world. And this material includes broadcasts of orchestral and dramatic performances, of a great wealth and variety of films and other 'visuals', of talks on all subjects by experts, and from time to time of the results of the latest research to which even the best equipped schools could have no access by any other means. This contrasts British school broadcasting sharply with that of U.S.A., which the prevailing commercial system has abandoned mainly to a local and piecemeal development by a plurality of small stations. The same conditioning factor has helped to distinguish the main purposes of the two systems. British school broadcasting has concentrated on needs which are common to large numbers of schools and children and has aimed to extend and enrich their curricula as fully as possible with its own resources and qualities; to bring into schools something new and different which they could not have in any other way, and so not to provide a substitute for the teacher or his textbooks or pictures, but to "supplement his work on the imaginative side".

Most of the other democratic countries which have school broadcasting have followed the British rather than the American pattern, though nowhere on such a large scale, and the B.B.C. is visited every year by people from all over the world anxious to study its methods. It may even be said that the B.B.C. has been imitated in totalitarian countries, too, in so far as their school broadcasting has been organized nationally rather than locally, and this may serve as a reminder of the inherent danger of centralization in all broadcasting. The abuse of this would of course not be tolerated here, but we are also guarded from it in particular by the traditional independence of our teachers, who are free to use or reject the broadcasts as they wish; by the supplementary character of the broadcasts themselves, which require the teacher's help for their effective development and thus play a different part in each classroom in which they are taken; and by the system of control which school broadcasting has evolved for itself.

The B.B.C. has held from its earliest days that with its monopoly power it should only broadcast to schools with the guidance of the educational world itself. Thus the policy of its school broadcasting is controlled by the School Broadcasting Council for the United Kingdom, a body representative of the main educational organizations and interests of the country. This Council, which is kept informed by a staff of its own of the situation in the schools, presents an annual request to the B.B.C. for the broadcasts which it judges to be necessary, and which, when granted, it commissions the B.B.C.'s School Broadcasting Department to plan in detail and produce. This department, which has

available to it the full resources of the B.B.C., has an experienced professional staff, most of whom have previously been teachers. Thus the teacher's needs are studied, his advice is consulted and his judgment and skill are drawn upon at every stage in policy making, planning and production; and the continuous contact maintained through the Council's regional officers with schools, local education authorities and the educational world at large gives school broadcasting a scope which extends well beyond the provision of its broadcasts. A single school broadcasting service covers the whole of the United Kingdom, but by a certain measure of devolution the distinctive additional needs of Scotland and Wales are met by parallel organizations of their own. The B.B.C.'s system includes both sound and television broadcasting, although the monopoly of the latter is now shared with others. The pioneers among these others, Associated-Rediffusion Ltd., have followed the B.B.C.'s example of seeking the guidance of the educational world in their school broadcasting and have set up a somewhat similar organization though with more purely advisory functions.

School broadcasting in sound offers programmes to every kind of school and to children of every age from five-year-olds to sixth formers. Television has so far concentrated its much smaller provision on the secondary modern schools, but extensions to sixth forms and primary schools are already being planned. The two media between them make some contribution to almost every school subject except spelling.

There is an element of story, often dramatized, or music or both in almost every broadcast for primary schools, and largely by these means a heightened reality is given to almost everything a good broadcast touches. Its role there is to help the children's imaginative exploration of their world, and many teachers value it less as a contribution to any specific subject than as a starting-point for expression work of often surprising keenness and originality.

Broadcasts continue to play the same role in the secondary schools, but here they are valued perhaps less as experiences complete in themselves than for their illumination of particular points in a school syllabus, for the new ideas they bring, for their authoritative commentary, and for their performances of fine music or literature which can help to develop children's appreciation and even occasionally bring to them a "vision of greatness". For many schools the broadcast religious service is also a weekly contribution to their assembly which they would not readily miss. To still older children working for the G.C.E. in the secondary modern or grammar schools, broadcasts can give valuable help in the study of modern languages. And for sixth formers there is the opportunity for science and arts specialists to enjoy together and be extended by broadcasts from some of the leading

scholars, thinkers, and artists of the outside world. It seems likely that the role of television in the secondary schools will be similar, though with a new power of demonstration in science and the visual arts and possibly a more restricted range in literature and music.

Broadcasting has educational significance not only as a distributor of material but as a medium of communication. It is often far more direct, and for many people more intelligible than the printed word. It can quicken the power to imagine distant places or events; it can bring the most arid and abstract facts to meaningful life, and it can help children to enjoy literature which few teachers would otherwise dream of attempting with them. How many secondary modern schools have *The Mayor of Casterbridge* or *Dr. Faustus* on their reading list, or often embark on such discussions of characters and motives as these have evoked whenever they have been broadcast? Briefly, broadcasts explore new ways into children's minds and widen and deepen the possibilities of what may be taught.

More than 70 per cent of all the schools in the United Kingdom are equipped to receive sound broadcasts and make some use of them, though the amount they are used varies greatly from school to school. The series which draw the largest audiences—more than 10,000 schools each—are “Singing Together”, “Music and Movement”, “Nature Study”, and “Travel Talks”. These are all designed for primary schools, and indeed all the series for primary schools have large audiences. The secondary schools with more specialized syllabuses and more complex time-tables are generally more selective in their use of the much wider variety of subject-matter available to them in a larger number of broadcast series. Compared with “Singing Together”, “Intermediate German”, taken by about 250 schools, might seem almost neglected. These 250 schools are, however, all grammar schools and are 33 per cent of the grammar schools which both have wireless sets and teach German. They are among the most critical and appreciative audiences that the B.B.C. has, and the maintenance of the series over many years shows the importance attached to the needs of even small minorities to which broadcasts can make a really valuable contribution.

On the whole, the smaller and more remote a school is, the more extensive is its use of broadcasts; the richer do the resources of broadcasting seem in comparison with its own. It does not necessarily follow, however, that broadcasts can do most for those who have least. This is sometimes assumed in the most amply equipped secondary schools, but in these the teachers who most use broadcasts are far from being the teachers who are least able to help themselves.

The Teacher's Responsibility

It is indeed the teacher who determines whether, where, how much and how well school broadcasts are used. This makes their use extremely varied and also makes it difficult to generalize. Where broadcasts are taken they may be taken every week or only once or twice a term. A series may be used systematically as the basic material round which a teacher plans his syllabus, or a particular broadcast may be taken because it happens to fit in aptly within the teacher's existing syllabus. Or the series or individual broadcasts may be taken as a stimulating 'extra' without close relation to any particular syllabus. Similarly, the time given to them will vary from a minimum of preparation and follow-up by the teacher within a single lesson period to perhaps very occasionally the development of an elaborate project over a whole term or even longer. As the purpose of school broadcasts is imaginative, so the best use of them will appear in a creative form—class discussion, for instance, further inquiry, reading, dramatization, or painting. But it need not always appear overtly in any given piece of work or at any specific moment.

There is also, indeed, a good deal of vague and casual use of broadcasts, and at the worst they may serve merely as a stop-gap. Lord Beveridge's *Report on Broadcasting* points out that "it is easier to provide first-rate educational material than to get it used to the full", and that it is not clear "that all things go equally well at the listening end". This may be almost a platitude, and the Ministry's pamphlet No. 20, *School Broadcasts: A Sample Study*, mitigates it so far as to say: "Almost every school taking part in this study seems to have appreciated the need of active co-operation by the teachers who used the broadcasts." One must ask, however, whether teachers make as good use of the broadcasts as of the more traditional teaching aids, or even as good use as they might. Here the answer is at least doubtful, and it will be worth while to consider some of the difficulties and problems which face the user.

The most obvious problem for the teacher is how to fit broadcasts which can only be taken at their own fixed times into his own syllabus and time-table. Indeed, the taking of broadcasts by even one class may affect the organization of a whole school and may have to be planned months ahead. This problem solved and the right class assembled at the right time, the same ephemeral quality demands constant close attention to the broadcast from teacher and children, who have to adapt themselves to its speed, and who can never look back to see what they have missed. The same quality, as a rule, makes it impossible to give the teacher more than a very general indication in advance of the

broadcast's content, and its very newness and freshness which he welcomes is apt to catch him unawares and afterwards to extend to the full his powers of improvisation. Lastly, a medium intended "to supplement the work of the teacher on the imaginative side" calls on his part for imaginative handling.

The use of the broadcasts is also too often hampered because their function is misunderstood. Because broadcasts present to the children men and women who from time to time may do many of the things that teachers do, the role of the broadcast is often confused with that of the teacher. Warnings are still solemnly given that it must never be allowed to take his place, and it is still often misleadingly referred to as a "broadcast lesson". As a form of educational material designed to help the teacher, the broadcast may be compared more aptly to a book or a film. But this comparison also can be misleading, and we badly need some study of the respective functions of all three as fundamental media of communication, and not merely of broadcasts and films lumped together in a sort of educational apartheid as "audio-visual aids".

Better use of school broadcasts must depend very largely on the training colleges, which sooner or later will have to recognize as central, in their own work also, this whole problem of media. The problem is the more urgent because of the position broadcasting has attained in the world at large as a powerful influence on society, which not only contributes to education in many ways, but which may help in even more important ways to condition it.

Little formal research has been carried out into the educational results of school broadcasting, though the School Broadcasting Council has for years been making extensive audience studies of a practical kind for the development of the B.B.C. service, and a few of these have been published. Valuable work has also been done by individual teachers in observing their own children, but this has not been co-ordinated. It is difficult in any case to isolate with scientific precision the results of a contribution which is essentially supplementary, and even more unprofitable to apply quantitative tests "on the imaginative side". Without research, however, one may assert that school broadcasting has certainly helped to extend and enrich beyond what was ever imagined thirty years ago the content of what is now taught in schools. This appears outstandingly perhaps in school music, which owes almost more to the B.B.C. than does the musical education of the country as a whole outside school. One need only mention such names as Sir Walford Davies, Ann Driver, and William Appleby; and the help school broadcasts have given here has no doubt been the chief single reason why the radio set to-day is normally regarded as essential school

equipment. Music, however, is only one example. Less use may be made of history and English broadcasts, but those who do use them have found them hardly less rewarding, and many a teacher who does not use them owes to them more of the range and repertory of his syllabus than he might suspect. It is often through the help given by broadcasts that pre-history and current affairs are taught at all in schools. Interesting new possibilities begin to be opened up, especially by television for science and geography; and in every subject both television and sound constantly introduce interesting personalities of all kinds. This experience of a far greater variety of people may be the greatest change of all which broadcasting has brought to children in school.

It was feared by some that television broadcasting might have little to offer to schools which they could not have already by means of classroom projected films. Experience has already shown that this is not so. For one reason, while films are always likely to be more convenient for detailed study or revision work, and can be used again and again, television, largely because of its quicker production and distribution, covers a much wider range of subject-matter and is likely to be the more flexible and apt introducer of new experiences, illustrations, and ideas. Each of the two has, in fact, its own quite distinct role to play in the schools.

Throughout its thirty-five years school broadcasting has aimed consistently at the highest possible standards in everything it has done. Nothing less, it has been held, would justify school broadcasting, and by many teachers nothing in school broadcasting has been more highly prized. The long-term effect of this on children must be a matter for faith rather than exact assessment, but there is little doubt of its influence, through the children's illustrated pamphlets, on school publications.

Finally, among the imponderables, perhaps the most important result of all has been the influence of school broadcasting upon teachers, who, in the opportunity given by its rich resources, in the example of its varied presentation, and in the challenge of its quality are offered a continuing refresher course throughout their teaching life.

All these results of school broadcasting are together substantial, even though, with more understanding use of it, they might have been and may become greater still.

R. C. STEELE.

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CHAPTER FOUR

Symposium on Mass Media in Australia

A NATIONAL television programme brings the opening of Parliament or an American Western directly to the attention of thousands of homes. Long playing, high fidelity recordings bring the classical genius of Bach or a cacophonous perversion of an Australian national folk-song over the air into hundreds of thousands of radios. Films bring the Bolshoi Ballet or Frankensteinian monsters within visual reach of millions. Print enshrines for all who can read epoch-making discoveries or the most sordid of human behaviour. Whatever view we hold about their value, these media are part of Australian community life, their content influencing our knowledge, our attitudes, our habits of thought and action. What use should be made of them in schools—both of the material they present to the adult world and of the opportunities they offer to present specially prepared and specially selected material?

In the sections that follow, Messrs. C. R. Bull, E. Perry, and T. R. M. Sloane have shown, in different ways and with different emphases, how Australian schools are provided with and make use of sound-radio, filmstrip, moving film, and television, particularly material specially designed for schools. But with the restless flood of other materials pouring out from the mass media and flowing about the schools, neither teachers nor parents can remain unconcerned. Two or three principal reactions by schools may be noted. One is the application by some teachers of the good principle of relating school studies to life, directing the attention of their pupils to such matters as particular television and radio programmes, particular films, particular books, and so on, and making a feature of discussion of these in school. Another is a more generalized approach—the sustained attempt to establish and raise standards of judgment by exposing children to good literature, good music, good art, and good film selected from this flood, and undertaking some measure of critical appraisal of them in order to direct attention to those salient features on which informed judgment can rest and from which reasonable criticism may develop. Still another is the deliberate attempt to cultivate the manifold skills involved in critical thinking, including reading comprehension, listening comprehension, the suspension of judgment in the absence of data, the collection and analysis of information, the recognition of assumptions,

and so on. Many aspects of these approaches find their best and most developed illustrations in secondary schools, but valuable work in all of them is done in many primary schools. All of them need more widespread development, and all require greater preparation than our relatively short courses of training for teachers can at present provide.

The individual contributors mentioned above, each a specialist in the field about which he writes, look at their problems in different ways. The total effect is to show something of the methods of organization, the scope of provision in the several state departments, the critical issues in distribution and use as these are seen from different viewpoints, and some of the future points of growth. Probably the sharpest impression will be that in each of the three there is conviction but not complacency.

W. C. RADFORD.

Sound-radio

SOUND-RADIO in the Australian school has been throughout its history an exclusive service of the Australian Broadcasting Commission. The A.B.C. is the Australian counterpart of the B.B.C. but, from its inception in 1932, has co-existed with commercial broadcasting stations organized on the American pattern. There are no broadcasting stations in Australia conducted by universities, education authorities, or other bodies. Nor, outside the school services, are there any organized courses of educational broadcasts, however broadly educational a significant percentage of broadcast programmes may be.

Australian broadcasting to schools has been based on the principles established in this field by the B.B.C. in that it brings into the classrooms not lessons, but material complementary to the work of the teacher, presented in ways beyond the resources of the school. The A.B.C. provides programmes planned with the advice of educationists and practising teachers and devised and produced by professional educational broadcasters.

The size and educational organization of Australia brings into its educational sound-radio certain conditions very different from those of Britain. The A.B.C. broadcasts over an Australia-wide network of medium- and short-wave stations. It is therefore possible, as in Britain, to provide a programme simultaneously to every listening school or to every home in which there are children of an age to listen to the daily pre-school broadcasts.

Education in the Federal Commonwealth of Australia is a function of each of the six State Governments. There are differences between the States in educational policy and emphasis; there are different leav-

ing ages, examination requirements, and teaching methods. For these reasons, together with the need for close contacts with the teaching profession in so large a country, most broadcasts to schools are organized and disseminated from the capital city of each State for the schools of that State. General educational policy is directed from the headquarters of the A.B.C. in consultation with the State Directors of Education as a body in conference.

This system of decentralization and co-ordination has produced a very flexible structure of school broadcasting. It has resulted in the use of sound-radio services by over 90 per cent of Australian schools and a high degree of integration of radio broadcasting with the educational system which embraces Government, denominational, and independent schools.

Use of School Broadcasts

Australian use of this medium of mass communication falls into three broad fields.

More than half the Australian population of ten million is to be found in the six capital cities, where schools and classes are large. Individual teachers select sound-radio programmes that will arrest the attention of classes and provide material in forms beyond their local resources or capacity. In the better schools much extremely skilful work is done in exploiting the stimulus of the broadcast experience, coming from a source outside the school, to provoke significant discussion and practical work. No doubt in the weaker schools the radio is used as a substitute for purposeful teaching, but scores frequently by the impact of its drama, or its fresh material, or its artistic presentation.

Although more than half the Australian population lives in a few cities and large towns, more than half the schools of Australia are in the country, and of these a high proportion are quite small. The one-teacher rural school has played a notable part in Australian education by bringing as far as possible equal educational opportunities to all. In the country school, and particularly in the one-teacher school, sound-radio has become an essential part of rural school education and a symbol of the policy of equal educational opportunity. Sound-radio literally provides the small and isolated school with the large school's variety of staff and richness of curriculum. It supplies information outside the teacher's own endowment, it provides experience of singing, music, poetry, and drama, and it keeps the teacher—and many parents—in touch with ideas and teaching methods. In these sound-radio services, organized as they are, the Australian school possesses an instrument of real educational and social significance. •

The third field is that of the outback child. There are great areas of

Australia where population is so sparse that it is physically impossible or economically impracticable to provide schools. There are isolated cattle or sheep stations, there are itinerant prospectors, linesmen, and hunters, and there are the inland missions. The children in these isolated homes or temporary abodes depend for their education upon the State correspondence schools—"the School in the Mail Box", as it is called.

Sound-radio can and does play a most significant part in this service, not only through its regular programmes to schools but also by special programmes designed in close co-operation with the correspondence schools themselves and providing those experiences, oral instruction, and social contacts, otherwise impossible, to this excellent educational service. Sound-radio is the vital link between teacher and child and between the child and society.

While dealing with radio for the outback child, the schools of the air must not be overlooked. The Education Departments of New South Wales and South Australia have established small broadcasting studios at several centres which use by courtesy the shortwave services of the Royal Australian Flying Doctor Service for a limited period each day. In these areas most groups of the inhabitants now possess battery-operated transceivers. Hence the teachers of the schools of the air can instruct children in widely scattered homes, can ask questions and receive replies, which, in addition, can be heard by all other listeners. The measure of this two-way traffic is small, but it is as important socially as it is educationally. It is a dramatic use of sound-radio for education over vast distances, the idea of a noted South Australian educationist, Miss Adelaide Miethke.

Achievements and Difficulties

Certain very valuable observations may be made from the operation of the nation-wide system of sound-radio broadcasting to schools and to pre-school children. These broadcasts play an important national part in a country where population is unevenly distributed and where distance and differences of historic origins may contribute to parochial attitudes. On the other hand, the controlled decentralization of broadcasting stimulates local experiment and a healthy rivalry, and contributes variety in a community more notable for its likenesses than its differences. Educationally, mass media of communication are playing a large part in introducing fresh ideas and new methods of classroom presentation; they are giving a chance of a better balanced and much richer education in small communities. Any risk of uniformity is obviated by the great variety of method used in integrating broadcasts with the organized work of the school.

No human systems, however, are without their weaknesses. In the use of sound-radio there is undoubtedly the tendency, especially in the small school, to use too many programmes and thereby make them teacher-substitutes rather than the raw material of learning, or part of a total experience that finally emerges into significant action. In a teaching service of many thousands there must also be lazy individuals who welcome a mechanical assistant; and there are unimaginative teachers and administrators who can transmute any material or method into a dull routine and see virtue in that dullness.

There are finally two restrictive influences that adversely affect the contribution of broadcasting in the secondary school. At the school end, the Australian faith in standardized syllabuses and external examinations brings a rigidity into the secondary school and places a premium upon the acquisition of examinable facts to the detriment of imaginative and realistic experience. At the broadcasting end, there is a weakness in finding methods of presentation suitable to the growing capacity of the adolescent who needs skilfully adapted adult approaches rather than the methods of the primary school applied to more difficult subject-matter. There is evidence that broadcasting could play a very much greater part in secondary education, particularly for the less academically minded adolescent, but will do so only if it can find better approaches and be given, or induce, a more favourable field in which to operate.

It can be claimed that the use of modern media of mass communication in sound-radio has done much to break down the barrier between the school and the outside world. Broadcasting is the only educational service organized outside the school system, though in close co-operation, which has universal and immediate access to the school. It has given ears to the schools and re-oriented some of their attention. To the eternal credit of the teachers, the schools of Australia have turned sound-radio into a force in education.

C. R. BULL.

Filmstrips

EACH Education Department in the six States of Australia has established a fairly comprehensive visual education centre responsible for the selection, utilization, production, and distribution of films and filmstrips.

In general, libraries of motion-picture films have been built up by purchase of films produced commercially, but in the 35-mm. filmstrip field each department has established its own filmstrip production section.

Whilst it has been stated that the reasons for the establishment of Government film production centres arose because no commercial firm would undertake the costly job of producing educational filmstrips for a local course of study with a limited market, it is the opinion of most educationists that it is far better for an education authority to control and assist its own instructional programme through its own teachers.

The staff at each centre consists of teachers who have been brought in from schools for the special purpose of appraising and selecting existing material, suggesting titles and/or scripting for production.

It has been found that the use of this type of staff is fundamental to good selection, as a thorough knowledge is essential both of the subject material and of the group which will use the aid. People with such a background, too, are needed to interpret the needs of teachers.

Basis for Selection of Material

Some of the outstanding reasons for providing filmstrips are :

- (1) To provide information which teachers find difficult to obtain.
- (2) To provide illustrations which teachers find difficult to obtain.
- (3) Many filmstrips edited by eminent authorities provide teachers with the confidence to approach a lesson which they might otherwise find difficult.
- (4) Because of the thorough preparation that the scripting teacher puts into a filmstrip, the standard of work of the less skilled teacher is raised.
- (5) Filmstrips help to ease the burden of subject preparation, particularly for the rural school teacher who has a considerable range of topics to prepare each day.
- (6) To provide through the illustrations experiences which give pupils a welcome change from general routine—often a vicarious experience of the outside world that they would not have been able to enjoy otherwise.

Some Technical Considerations

A familiar and reasonable criticism of the filmstrip as an aid to teaching has been that it involves the abnormal interruption of preparing the room for projection. Over the past ten years, however, considerable progress has been made towards the ideal situation of using the filmstrip projector under normal classroom conditions. Today, high-powered projectors (1,000 watt) and efficient screens will enable the filmstrip to be projected in near-daylight conditions, thereby giving the filmstrip the same practical advantages as other aids—refer-

ence books, flat pictures, models, and the like. Teachers with suitable equipment can develop a closer affinity between the filmstrip illustration, the blackboard, and the recorded work.

However, although the above conditions are imminent, considerable adjustment has yet to be made. The Victorian Visual Education Centre, for example, carried out experiments and investigations in co-operation with practising teachers to determine the relative efficiency of single- and double-frame filmstrips. The outcome of the investigation was to favour the adoption of a policy of producing filmstrips in double frame, a policy also favoured in New South Wales, Tasmania, and South Australia.

By producing double-frame filmstrips and recommending for subsidy only those projectors conforming to strict technical requirements, the centre has paved the way for optimum projection conditions in normal classrooms. In order to determine to what extent schools could take advantage of these conditions, a census was taken of the numbers and types of projectors and screens already in schools, and of teacher preference for single and double frame. The following table is a brief summary and analysis of the census—taken in some 1,560 Victorian Schools.

<i>Projectors in Schools</i>							
Under 500 watts	.	.	.	.	.	.	Total 1,260
500 watts and over	.	.	.	.	.	.	300
<i>Screens</i>							
Portable	.	.	.	.	.	.	702
Others	.	.	.	.	.	.	72
<i>Type of Filmstrip Preferred</i>							
Single frame	.	.	.	.	.	.	112
Double frame	.	.	.	.	.	.	585
No opinion	.	.	.	.	.	.	788

Of the projectors under 500 watts, approximately 700 will show single frame only. This means that of a total of 1,560 projectors only about 850 will show both single and double frame, and of these only 300 are really capable of providing sufficient illumination for near-daylight projection on the screen of recommended size (the minimum permissible size for the average classroom). This is in direct contrast to the preference for double frame expressed in the third section of the table above. The large number expressing "no opinion" suggests that these teachers have not used filmstrips at all, or are not conversant with double-frame projection. The adaptability of light, portable screens explains the preponderance of this type in schools.

Two disturbing features revealed by the census are that the majority of projectors in schools are unsuitable for near-daylight projection and that many of these are inefficient machines, and have never been recommended or have long since been removed from the recommended list. It is apparent, therefore, that it will not be possible for very many teachers to obtain the full-benefit of the technical considerations which go with the double-frame filmstrip if schools continue to use antiquated equipment or neglect to follow recommendations when they purchase new equipment.

Utilization of Materials

Just as the general method of teaching takes into consideration every phase of the learning process, so must visual aids take their place in the lesson plan according to the service they render at any given stage. In short, visual aids may be defined as devices which assist at the appropriate time in the presentation of the matter to be taught by offering a semblance of reality which gives seeing experience and therefore makes a stronger and more vivid impression on the mind of the student. Of all visual aids, it is believed that teachers find the filmstrip, used efficiently, the most useful for day-to-day instruction.

The strip may be turned forward or backward, so that it is possible to refer back, if considered necessary, to a picture that has been screened earlier. It is also possible to turn the frames over rapidly so that only a part of the filmstrip, or even a single picture, need be used for the purpose of any one lesson. Filmstrips, moreover, will fit into the various methods of teaching. They are used in many ways of which the following are the most common:

(a) *Picture Study.* A single illustration may provide the basis for discussion for a complete lesson.

(b) *Formal or Direct Teaching.* Illustrations in sequence may be used for the initiation and presentation of every step in the lesson.

(c) *Interest and Illustration.* As well as arousing and maintaining interest the picture and title serve to make more vivid what has already been taught from the blackboard and textbook.

(d) *Initiation of Pupil Activity.* In some filmstrips no directions are given for activity work, but the teacher will find many opportunities for suggesting activities that might be undertaken by the pupils. Composition, drawings, models, plans, diagrams, graphs, summaries, and 'littleman' lectures are some of the activities that might follow a filmstrip lesson.

(e) *Initiation of Pupil Investigation.* Filmstrips may be used for this purpose in schools where a good library is available for reference. The filmstrip provides a background of knowledge necessary for a proper

understanding of the topic. Many filmstrips now available have related 16-mm. motion-picture films which provide further information.

(f) *Use with Assignment.* A filmstrip may be used by one group of pupils without any interference with or from the remainder of the school (rural) or class. All filmstrips are made on a non-inflammable base; therefore children can handle them with complete confidence.

(g) *Recapitulation and Testing.* Filmstrips serve as valuable aids for revising or reviewing a topic. It is at this stage that filmstrips may be best used as a whole.

Thus it is seen that the picture can become a useful and integral part of the lesson plan and, while assisting the presentation of a lesson, will also enrich the work of the classroom. It is also evident that its misuse (as with all aids) will hinder rather than assist teaching and learning processes.

Production

When a producer has decided upon the topic he wishes to illustrate on the film, he must consider it in the form of a planned lesson, as follows:

Introduction. Involving the psychological preparation of the pupil for receiving new work.

Presentation. Involving the unfolding of new information in a logical and simple manner.

Application. Involving some exercises requiring the pupil to use the information that has been given.

Suppose, for example, the topic upon which a film is to be made is "South Africa". It must first be decided whether the approach is to be by reference to history (early discoveries), to commerce (imports from South Africa), to geography (countries of the world), to biology (flora and fauna), or to any other aspect that links up naturally with what has already been taught.

Different topics lend themselves to different forms of approach, but the choice of approach is important, because it is on this that the success of the lesson may depend.

Once the approach to the strip is determined, and the frames of the strip outlined, it is the job of the photographer to carry on with the production. Only the best black and white illustrations are accepted for reproduction. A high photographic standard of filmstrip production is now characteristic of each of the States.

An exchange of filmstrip negatives between education departments is now practised. Each centre has several hundred filmstrip titles, copies of which are made available to schools at a nominal cost.

Distribution

Distribution procedures differ somewhat from State to State. In Victoria, South Australia, and Tasmania, for example, filmstrips are put in metal containers and sold to schools at 2s. 6d. per copy. In New South Wales a selected number of titles is printed each year and distributed free to those schools with suitable filmstrip equipment. Schools may therefore build up substantial libraries of filmstrips to suit their particular purposes and approaches.

E. PERRY.

Moving Film

THE moving film has become an accepted feature of Australian social life and the family's entertainment has been, for the most part, enjoyed at the local cinema. The regular viewing of the moving film bill-of-fare has provided a focal point for family discussion, and the development of certain tastes and standards in both documentary and feature film. Children and adolescents have developed a sophistication in moving film, particularly sound film, and have shown a capacity to make some subjective critical appraisal of film.

All States of Australia, with their individual and independent education systems, have accepted the moving film as an important aid for classroom instruction, and there is a definite preference for sound film. For example, New South Wales has approximately 2,500 schools, of which roughly half are schools with more than one teacher, and 1,000 schools possess sound film projectors.

Acquiring Moving Film for School Use

Each State in its own way has acquired films to establish film libraries. Queensland, Western Australia, and Tasmania, in addition to purchasing films, produce moving film for educational purposes. Victoria plans films according to curriculum need and seeks the services of commercial agencies to produce them. New South Wales purchases films on appraisal as its main source of acquisition, although some few films have been produced by commercial producers under direction. The Australian National Film Board presents to each State three prints of *Australian Diary* and of every 16-mm. black and white documentary produced by the Board, besides undertaking a limited production programme of sound motion films for classroom use. Perhaps it is unfortunate that the Australian National Film Board, which was originally modelled on the Canadian National Film Board, has never really enjoyed executive powers, but has developed as an advisory board to a Minister of the Crown. Therefore, its potential as a producer of

important educational films has been curtailed by limited resources and the necessity to produce film sponsored by Commonwealth Government departments for the internal and external projection of Australia.

Films purchased in Australia for classroom use are either British, American, or locally produced by commercial agencies. To this must be added presentation prints of films produced by large commercial organizations for publicity purposes. Whilst the quality of some few films in this latter category has been good (as documentary film) by international standards, it is considered that in most instances publicity of the producing company has taken precedence over educational purposes in the films produced.

Distribution of Moving Film

Acquisition of film by production or other means must of necessity be closely related to distribution if usage for instructional purposes is to be effective and significant. Each Australian State has established a film library centre for distribution of requested films as one of its important functions. Catalogues of films are provided and schools are invited to select films relevant to their curriculum programmes and apply for them to be delivered on given dates. The libraries make every reasonable effort to meet such requests, and there is sufficient time tolerance to permit preview of films by the teacher.

Some Weaknesses

A weakness in the system becomes evident when the films requested are not available, and other films (not quite what the teacher wants) are substituted. Such a weakness has been engendered over the years by an anxiety to acquire titles rather than prints of films, and appears to be a fault common to all States. For example, one State library contains 3,219 prints, the total number of titles being 2,121. That the weakness is recognized is evidenced by the fact that the same library in a recent financial year purchased 219 prints of films of which only twenty-nine were titles. In order to ensure that appropriate films are available for certain curriculum purposes, schools are developing their own school libraries of moving film.

States which produce educational film have displayed the same anxiety to acquire titles rather than prints of films. For example, one State listed a total of eight prints for four titles produced, while another State listed seven prints for three titles. This does not suggest that the films produced would be circulating very extensively whatever the demand. It does suggest, however, that there was no careful investigation of the distribution field when the production of films was undertaken. Such lack of fundamental research is harmful both to the pro-

duction and use of moving film as an educational aid, since the financial outlay would be excessive for the educational return.

Whilst visual aids for instructional purposes have been recognized for centuries as sound educational method, moving film developed so rapidly that it is safe to say that mechanical invention outstripped the development of adequate teaching methods. Teachers have shown uncertainty in their methods of approach to the use of moving film. Some have even become projection technicians rather than teachers, and have been content to abdicate as teachers in favour of a spoken commentary. In-service training in the use of visual aids, including moving film, has become annual fare offered by education authorities in Australia. Vacation schools in visual education are arranged for teachers, and one State has gone so far as to organize a course of instruction leading to a Certificate of Proficiency in Visual Education. That teaching techniques are beginning to overtake mechanical and scientific development is demonstrated by the fact that many teachers subscribe to the opinion that each moving film should have a related filmstrip which would emphasize the salient features of the moving film and facilitate follow-up exercises. The implication is that teachers are aware that, in general, they are not getting the best from moving film, and that preparation or motivation, comfortable, concentrated viewing and follow-up are essential to the technique of optimum usage of moving film as a visual aid.

Teachers and administrators in education have realized that make-shift provision for viewing moving film is poor educational economy. The days of darkening assembly halls and rooms and taking the whole, or a large part, of the school population to the 'pictures' are in the past-to-be-forgotten. In Australian States building standards for modern schools, both primary and secondary, require special provision for the use of moving film in general classrooms, and particularly in special purposes rooms for secondary education. No modern physics laboratory or geography room would be complete unless provision were made for the use of moving film as well as other visual aids, and architects of school buildings are making such structural provisions. Throughout Australia, where rural electricity schemes have brought power to small communities, even one-teacher school buildings are designed to facilitate projection of moving film.

Some Needed Research

In schools where the use of moving film as an aid in classroom instruction is adequate and proper, children know as well as anybody else the value of films produced in a well-organized, straightforward manner, portraying matter of real interest to them. Children are by nature

curious and in a hurry to explore and investigate to the limit of their capacity. What teaching aid can compare with the sound moving film to satisfy their wants? What is lacking in the Australian use of moving film for schoolroom purposes is some real and fundamental research to determine what is the best type of film, the best way to treat such film, and how to present it to assist the teacher in his task of developing knowledgeable, responsible, thinking human beings.

T. R. M. SLOANE.

Television

ONE of the striking reactions to television has been the immediate recognition of its educational possibilities. It was years before the educational value of films was applied, and some time before sound-radio was adapted to the needs of the School. It is true that the visual affinity of television to the film, and its broadcast relationship to sound-radio also led people naturally to consider the place of television in education. Hence the history of educational television has been far more a process of determining its peculiar fields of educational value than a struggle, as with the film and sound-radio, for its educational recognition.

Present Organization

The use of television in the Australian school differs and will differ considerably from the use of sound-radio. In the first place, general television services were not established until late in 1956, and then only in the capital cities of the two most populous States, Sydney and Melbourne. Television was inaugurated simultaneously by the A.B.C. and by two commercial stations in each centre, so that from the outset the pattern of broadcasting adopted in sound-radio was followed. So far no other type of television service has been established, but the success of American educational television has led to moves by the University of Melbourne for the establishment of a purely educational station.

From the outset, the A.B.C. has provided experimental services for schools and has reached at present an output of one daily programme each for schools and for pre-school children. These services will extend by the middle of 1960 to the capital cities of the four other States, but it will be some time before children in the country beyond a radius of a hundred miles from the capital will benefit from this service. Hence television will bring a further amenity to the schools of the larger centres of population rather than to the less well served country child. It may well be that the visual impact of professionally devised television programmes for schools will have far greater importance to the isolated child than to the city child. This child, however, will prob-

ably wait a long time because of the relatively greater expense and limited coverage of television.

Lines of Advance

The present school television services are still in an experimental stage and confined to a small number of schools which have been able to equip themselves with receivers. This limited experimental period is regarded as of vital importance to the development of television in the school; it has proved equally valuable to train professional staff in educational television and to familiarize teachers and children with this medium. From both ends, the superficial resemblances between television, the film, and sound-radio have posed problems and a challenge in determining the functions of television, and how to fulfil those functions.

These current experiments are being observed and studied both by professional broadcasters and professional teachers. Reports are made on each term's experiments and a number of important inferences have been widely circulated.

It would appear, in contrast to sound-radio, that television can be far more widely used for certain forms of direct teaching; not so much for increasing the size of classes for the outstanding teacher as for instructing normal classes in subjects or parts of subjects outside the range of the average teacher. Certain aspects of sciences or mathematics or technical work fall into this category. Otherwise television is a means of syllabus enrichment far greater in impact than sound-radio in those fields where the visual aspects of the subject are greater and the imaginative appeal less.

Then, again, it would appear that television is destined to have the greater educational impact upon those children who are less scholastically inclined, those of less academic ability, and those who need to see in order to understand. This inference does not overlook the value to children of all grades of intelligence of the many forms of aesthetic experience, through the arts and through drama. The early Australian experiments definitely indicate the capacity of television to arrest attention and to leave a grasp of a topic provided that topic is developed with every form of visual impression, not by means of a person who merely talks in vision. There is also strong evidence that the school television programme, valuable as it is in conveying information, is still more valuable in developing attitudes.

Perhaps the most significant general indication of the potential of television *in the school* is the fact of its isolation. As in other parts of the world, the Australian child tends to become an addict of the home television set. He sees programme after programme, remembering

scraps of each but seldom considering anything that he sees. The school television programme, on the other hand, stands alone. The general practice is to lead up to its topic in a class preparation, then to discuss the presentation of the topic, and proceed to some form of activity. By this means the significance of the topic can be appreciated by the child and its message properly assimilated.

The mass-medium of communication in television is thus very young in use in the Australian school. The attitude to television, however, is constructive and sound, in that professional effort is being made to study its form and use and that broadcasters and teachers are together seeking to define and direct its educational use.

C. R. BULL.

Other Media

Printed Matter

By far the most widespread influence is still exercised by books, magazines, newspapers, pamphlets, and other printed or duplicated materials. The steady growth of school libraries in schools of all kinds is no longer a matter for surprised or enthusiastic comment—it is accepted as an essential attribute of all educational systems. Children are not only being provided with more printed materials, but taught to use them. Book councils produce valuable and effective lists of books suitable for many purposes, teacher-librarians are being trained in increasing numbers, children are being taught explicitly how a library is organized and how to find information in it, and public library facilities are being developed to encourage the continued use of printed material outside school, whether for relaxation or to obtain specialized information.

More attention is being given to the quality of book production and to methods of presentation. Colour, design of page, and the aesthetic attractiveness of the printed page are regarded as important elements in encouraging the use of printed materials and ensuring that they do improve learning and provide incentives to use books willingly. New and attractive textbooks, using the best modern techniques, are steadily replacing the older, duller texts.

The facility with which materials for transient use can be reproduced within individual schools, or for special groups of pupils such as those undertaking correspondence courses, has made it possible often to supplement the printed textbook with other matter—either to bring it up to date, or to provide it with necessary local applicability, or to amplify its content in particular ways. In similar ways, special pamphlets on particular matters (bulletins on current affairs, leaflets on guidance, pamphlets on subjects and their teaching, journals of teachers of

subjects, and so on) have been a marked addition to the information and assistance given to teachers and pupils. The textbook as such is not superseded, but supplemented and supported in essential ways by such materials.

Tape Recorder and Radiogram

The gramophone (or the radiogram combining two facilities) and the tape recorder have both been used in recent years by increasing numbers of schools—for language work, perhaps, more than for other purposes, but also considerably for music. Speech training, foreign languages, dramatic work, and appreciation of musical masterpieces have benefited greatly from their use. Improvements in recording techniques have enhanced the value of the gramophone and an increased number of schools are establishing record libraries; experience and practice with tape recorders, and the technical improvements so rapidly taking place in the fidelity of their records, have given teachers a new aid of great value in improving speech defects, providing a variety of models and examples of good and poor language presentation, and demonstrating improvement.

Here the transmission of information and of new and successful practices to teachers has been aided by the use of the printed word, as well as by the older established and still effective methods of word-of-mouth from fellow-teachers, supervisors of special subjects, and inspectors and superintendents of schools.

Conclusions

It is still true that the direct teacher-pupil relation remains paramount in Australian educational methods, and there is no likelihood that this will change. Even with the work of the correspondence schools, and the school of the air, the new and improved media are being used to supplement the other devices and aids that the teacher has. They widen the fields of experience that the teacher can bring to children, they supply factual and imaginative experiences that would otherwise not be at his disposal, they help to deepen interest, and provide motive and incentive and other aids to learning, but the planning and direction and evaluation of the effect of education is still entirely in the teacher's own hands and will probably remain there. Only television appears likely to offer any real challenge to face-to-face teaching procedures; in an improved form, and in some particular ways, it may be able to do better than many teachers. To permit it to replace direct personal association of mind with mind would be a retrograde and not a forward step.

W. C. RADFORD.

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Mass Media of Communication in the Schools of India

In its strictest modern sense audio-visual education is comparatively new in India. It was first envisaged as an integral part of the educational system when the post-war Educational Development Plan was formulated in 1947. Its actual implementation on any considerable scale took place only during the first Five Year Plan.

Since time immemorial India has made extensive use of audio-visual aids. Over 4,000 years ago knowledge was handed down by word of mouth in the form of *Shrutis* and *Smritis* (words implying learning and teaching methods) and depended solely on hearsay and memorization. Visual symbols had their origin in cave drawings and murals which developed at a later stage. Pictorial forms, after going through the stage of hieroglyphics, gave rise to abstract symbols and built up our highly developed and refined phonetic script (*Devanagari*). Mental arithmetic no longer remained an obscure and abstract operation, but took great strides through the use of understandable symbols. The introduction of ZERO as a symbol to represent 'nothing' was perhaps the first visual aid that made history by being adopted throughout the world along with the 'arabic numerals' in preference to roman figures.

India, indeed, has a fairly rich heritage of traditional forms of audio-visual education, namely religious dances, dramas, puppet plays, story-telling groups, poetic symposia, mural paintings, cave drawings, and sculptures. The folk and classical dances of India have made a great contribution to the cultural development of society and to schools in rural and urban areas. Stage plays from ancient times are now being adapted to awaken the interest of children and the masses in the workings of democratic forms of government. Such aids have their roots in ancient, but living, traditions.

The percentage of literacy is low in India, and the cultural heritage tends to be transmitted largely through traditional media. Throughout India the sociological phenomenon of an educated but unlettered, cultured but illiterate, people prevails; for these people the written word is not the chief way of acquiring knowledge and information.

Before any discussion of the increased use of systematic audio-visual aids in India a brief appraisal of the general situation should be made.

The Dawn of Indian Independence

On 15th August, 1947, India achieved her independence. On 26th January, 1950, India adopted a new Constitution and declared herself a 'Sovereign Democratic Republic'. In 1947, after protracted negotiations, the British Parliament relinquished governmental responsibility, partitioned the country into India and Pakistan, declared each area independent and a dominion of the British Commonwealth of Nations, with full power to amend its Constitution and even to secede from the Commonwealth. At the same time paramountcy over the 522 native states was terminated. There was no longer either an Emperor or his Viceroy. The Governor-General became a constitutional head. The British Parliament ceased to legislate for India. A little earlier the Indian Government accepted the British invitation that the nation should remain a member of the Commonwealth. India recognizes the Queen of England as a symbol of Commonwealth unity. India owes no allegiance to the British Crown, but only to the President and the Constitution of India. In the Council of Nations she sits in her own right. India or Bharat now is a union of fourteen states and six union territories. The Republic is made by the people, who have given themselves a Constitution.

The preamble to the Constitution of India runs as follows :

We, the people of India, having solemnly resolved to constitute India into a Sovereign Democratic Republic and to secure to all its citizens :

Justice, social, economic and political;

Liberty of thought, expression, belief, faith and worship;

Equality of status and of opportunity;

Fraternity assuring the dignity of the individual and the unity of the Nation;

In our Constituent Assembly this twenty-sixth day of November, 1949, do hereby adopt, enact and give to ourselves this Constitution.

Fundamental Rights and General Problems

All citizens are equal before the law, and freedom of speech and assembly are guaranteed. There is no princely order; there is adult suffrage throughout the land and electorates are joint and no longer based on religion. There are no titles and no qualifications or disqualifications based on wealth, colour, race, or sex. India is a secular state and as such will not ordinarily interfere in religious institutions. The official language is *Hindi*, but English is to be used for fifteen years from the commencement of the Constitution. Minorities are assured of cultural and educational rights.

The Indian Constitution provides for universal *free and compulsory education* for all children between the ages of 6 and 14. Among the many challenges to free India to-day, there is none more important and

pressing than the reduction of illiteracy. India has already a universal adult franchise, yet about 75 per cent of her people are illiterate.

Prime Minister Nehru has said that whereas "a great people can generate the qualities of leadership in the men they select to represent them . . . the greatest leadership may fail if the people themselves lack the ability to recognize a necessary challenge and rise to the occasion".¹

What James Madison said many years ago about his country, the United States, holds good to-day in India. "A popular Government without popular information or the means of acquiring it is but a prologue to a farce or tragedy, or perhaps both. Knowledge will for ever govern ignorance, and the people who mean to be their own governors must arm themselves with the power which knowledge gives." It is not only knowledge that is required, but also the right kind of social training and the inculcation of right ideals. Training for democracy postulates a balanced education in which social virtues, *intellectual* development, and practical skill all receive attention. Such an education is rightly envisaged for the whole of India. Under the Constitution, education is a responsibility of the state governments. Education is mainly the concern of the states but, in view of its impact on the life of the country as a whole, both in the field of culture and technical efficiency, the Central Government cannot ignore its responsibilities for improvements of standards and for intelligently relating education to the larger problems of national life. The centre is directly charged with higher education. This cannot be done, unless careful consideration is given to the level of efficiency attained at the school stage. The aim of education in India is to train the youth of the country to be good citizens, who will be competent to play their part effectively in the social reconstruction and economic development of India.

The Raison d'être of an Audio-Visual Policy for India

Since the beginning of this century, many new techniques of teaching have been developed in response to the world-wide demand for education. Among the most significant are those involving the use of auditory and visual materials. Sound and pictures, with their universal appeal, offer unique advantages for teaching and for transmitting knowledge across frontiers. It is a part of the Indian genius that in matters of education, as in other spheres, she has not clung to the past nor has she been dazzled by everything modern in audio-visual equip-

¹ Jawahar Lal Nehru and Norman Cousins, *Talks with Nehru* (The John Day Company, New York, 1951), p. 10.

ment. A sense of balance and perspective has been maintained, so that the cumulative creative traditional audio-visual media developed over the centuries have not been allowed to go into obscurity but are effectively harnessed for use to-day. It is necessary to state clearly the *raison d'être* of an audio-visual policy for India. Although constitutionally education is the responsibility of the individual state governments, yet in order not to fritter away the limited financial resources allocated to audio-visual education the Central Government has outlined a broad plan for audio-visual education.

Many problems in modern India could be solved only through the co-operation of the Central Government and the state administrations in the use of audio-visual aids to educate the masses as well as school children. Many schools in India are working on a double and treble shift basis, and others hold their classes in tents. The inadequacy of educational facilities is alarming. India is a poor country, and our expectations have naturally to be limited by our financial conditions.

Background History of the Audio-Visual Aids Section

In order to present clearly the background of the present system of audio-visual education and to show how it has developed its various characteristic features, it seems necessary to mention the various government reports and recommendations which have studied the problem directly or indirectly.

The Central Government of India Audio-Visual Aids Section had its early beginnings in 1942 as an adjunct to the library of the Central Advisory Board of Education, now known as the Central Education Library. It consisted of forty-four silent films and four silent film projectors put to occasional use in arranging film shows at Delhi and Simla.

To investigate fully the problems of visual education in the field of primary, secondary, university, and adult education, an *ad hoc* committee on visual education was formed and the committee held its first meeting in July, 1948. The main recommendations of the committee related to the planning, production, and distribution of educational films, so that, in time, visual education might become an integral part of teaching. It was soon realized that the film was not the only, or even the most important, form of audio-visual aid and that it was necessary to expand the sphere of activities of the Central Ministry. In 1950 the film unit was accordingly renamed the *Audio-Visual Aids Section*, and it undertook a systematic collection of filmstrips, charts, posters, maps, and so on.

In October, 1951, an All-India conference on audio-visual education was organized by the Central Ministry in which the state governments

and some other representatives participated. Professor T. L. Green was invited by the government to advise on the development of audio-visual education in India. The conference drew up the following eleven 'action points' for implementation.

(1) A Board of Visual Education representing educationists, teachers, technicians, and others interested in this field, should be established to consider general policy programmes.

(2) A whole-time officer in each state education department should be appointed to develop audio-visual education.

(3) Exhibitions should be organized in different centres to popularize the use of, and to clarify ideas about, visual education.

(4) Teachers should be trained in visual education through training colleges and refresher courses, special stress being placed on how to use aids.

(5) Co-operation between teachers, educationists and commercial concerns for the production of visual aids should be encouraged.

(6) Training colleges and schools—both staff and students—should be used for the production of suitable audio-visual aids.

(7) There was a need for intelligent guidance in order to improve the standard, quality, and variety of production.

(8) In each state some type of educational museum where children's books, journals, and all types of visual aids—national and foreign—may be available for consultation and study by all concerned should be set up.

(9) Methods of making projecting instruments as well as visual aids economically and encouragement of inter-state co-operation for the purpose should be explored.

(10) There should be effective co-ordination and use of educational broadcasting.

(11) Audio-visual aids imported for educational institutions should be exempt from duty.

These recommendations were brought to the notice of state governments for their consideration and necessary action. It was in accordance with the first recommendation that the National Board of Audio-Visual Education was formed. This is the co-ordinating agency for audio-visual activities in India.

The first meeting of the National Board was held in 1953, the second meeting in 1955, and the third in 1958. A number of audio-visual schemes and proposals were initiated, and in a decade we have moved a great distance towards making audio-visual aids an integral part of education in the schools. India is a country of 360 million people, and there are not enough funds to provide even five years' primary schooling for all children, and therefore the position of audio-visual methods

is necessarily weaker. But in an integrated fashion audio-visual aids have filtered through to a good many schools.

Under the first Five-Year Plan—1951–6, the training of audio-visual experts was the only central scheme.

Two audio-visual seminars were organized:

(1) The first, organized by the Central Government, was held in Delhi in 1954. Thirty officials from sixteen states of India participated. No doubt, they returned with a deeper awareness of the audio-visual problems facing India. Thus, under expert guidance, they blazed a trail in the development of audio-visual education in various parts of India.

(2) The second seminar, organized at Lucknow in November, 1955, was a joint Indo-Australian effort under the technical co-operation scheme of the Colombo Plan. Teachers and administrators of eleven countries of South-East Asia participated. It was made known that the second Five-Year Plan will place audio-visual education firmly on the educational map.

Under the second Five-Year Plan—1956–61, with the limited resources available, practical systematic development plans for audio-visual education were worked out. The multiple-purpose programme covered three main aspects of audio-visual education: (i) administrative organization; (ii) training; and (iii) supply and production of material.

Seminars and Conferences (1955–7)

A seven-day All-India teachers' conference on audio-visual education was organized at Delhi from 7th July to 13th July, 1956, and was attended by seventy-eight delegates from various states. The conference discussed various aspects of audio-visual education and made recommendations on the use of blackboards, bulletin boards, charts and posters, models, silk-screen printing, field trips, aural aids, the radio, linguaphone records and tape records, filmstrips, and film appreciation.

The conference had four specific objectives in view: namely (a) to create an interest in the potentialities of simple audio-visual aids; (b) to provide information regarding modern audio-visual aids and equipment and recent developments in the field; (c) to provide an opportunity for the exchange of teacher experiences in the use of audio-visual aids; and (d) to strengthen the movement for audio-visual education by acquainting the teachers with the facilities the central and state governments were offering.

A four-day film seminar was organized by the Central Ministry from 27th to 30th November, 1956, for the benefit of school teachers

in Delhi. It was conducted by Miss Mary Field, Executive Officer, Children's Film Foundation (London), and Mr. J. B. Frizell, Director of Education, Edinburgh. The seminar discussed the following subjects: (1) teaching film appreciation in schools; (2) techniques of using film in education; and (3) modern aids in education.

Audio-Visual Convention of 1957

A two-day regional audio-visual convention of the members of the Central Film Library of the Government of India was organized by the audio-visual unit of the Central Ministry of Education in August 1957. The convention was attended by thirty-three teacher delegates and many observers. The Delhi Convention, the first of its kind organized in India, was only a pilot scheme. It has been responsible for the formation of an audio-visual society in Delhi and for advancing the idea of organizing similar conventions in other states.

The *Unesco Regional Seminar on Visual Aids in Fundamental Education and Community Development in South and South-East Asia* was held at New Delhi from the 8th to the 27th September, 1958. Delegates from the following thirteen South-East Asian countries participated in the seminar: Afghanistan, Cambodia, Ceylon, China, India, Indonesia, Iran, Japan, Korea, Philippines, Singapore, Thailand, and Nepal.

India sent six delegates to the seminar. It facilitated the exchange of knowledge and experience in the production and use of visual aids. The seminar also dealt with the evaluation and organization of visual aids services at national and local levels, and at the regional level with the co-ordination and exchange of materials and experiences.

Let us now consider the various schemes proposed for implementation jointly by the central and state governments.

Assistance to State Governments

(1) Audio-visual sections will be established on a state-wise basis. They will guide and direct audio-visual policy in the states and implement the recommendations of the National Board of Audio-Visual Education.

(2) State audio-visual boards or committees will be set up. They will provide a link between the teachers in India and the National Board.

(3) Training courses for audio-visual personnel at various levels will be organized.

(4) Audio-visual aids libraries will be established on a state-wise basis. On account of the vastness and the diversity of the country, it is desirable that regional or state audio-visual libraries should be formed.

(5) Equipment pools will be set up in district libraries.

(6) Audio-visual education will be introduced into teachers training institutes.

(7) Radio sets will be supplied to high and higher secondary schools.

(8) Workshops for the production of non-projected visual aids will be set up and mobile audio-visual units established.

Thus various schemes at the central and state levels are being implemented. The centre meets 50 per cent of the cost of the state government schemes. Through the concerted effort of the state and central governments, audio-visual education for schools in India has been on a firm foundation right from the inception of the programme.

The Central Film Library has drawn hundreds of visitors. There are at present 4,068 films, 1,558 filmstrips, and 442 books. The films and filmstrips are acquired by the Central Film Library on the recommendations of a review committee. School teachers are also nominated to this committee. The library has 1,212 member institutions spread all over India. Films and filmstrips are loaned directly to schools and other educational institutions. The annual circulation of films is about 11,000.

There are: (1) educational and instructional films; (2) children's entertainment films; and (3) full-length feature films, both Indian and foreign.

The above are the three main categories of films in the Central Film Library. The load on the library is reduced because in most of the states audio-visual libraries have been established by now, and the state libraries loan to schools films and audio-visual equipment. Some of the titles of the outstanding feature films available in the Central Film Library are given in Table I.

The mobile cinema unit of the Central Ministry of Education and similar units in the states render unique help to schools by bringing to the very schools themselves modern methods of teaching with projected and non-projected aids. It also carries out research and evaluation on a modest scale.

The Unit for the Production of Visual Aids (UPVA), attached to the Central Ministry of Education, carries out the following main duties: (a) the evaluation of existing non-projected material available in India; (b) the evaluation and research in technical and pedagogical matters; (c) the publication of brochures, monographs and leaflets on various aspects of audio-visual education; and (d) it gives advice and encouragement to private producers on non-projected aids.

It will, therefore, be seen that the UPVA has been set up by the Central Government for the systematic production and guidance in

TABLE I

SOME OF THE FEATURE FILMS AVAILABLE IN THE CENTRAL FILM LIBRARY—
GOVERNMENT OF INDIA

Title	Producer	Version	Duration
<i>Achhut Kanya</i>	Himansu Rai	Hindi	3 hours
<i>Dharti ke Lal</i>	Indian Peoples' Theatre Association	Hindi	1½ hours
<i>Do Bigha Zamin</i>	Bimal Rai	Hindi	3 hours
<i>Naya Safar</i>	New Theatres	Hindi	1½ hours
<i>Aurat</i>	National Studio	Hindi	3 hours
<i>Baap Beti</i>	Shenai Films	Hindi	1½ hours
<i>Chhota Bhai</i>	New Theatres	Hindi	2 hours 25 minutes
<i>Sikandar</i>	Minerva Movietone	Hindi	3 hours
<i>Tansen</i>	Ranjit Movietone	Hindi	2 hours 25 minutes
<i>Zalzala</i>	Art Films of Asia	Hindi	3 hours
<i>Parineeta</i>	Ashok Kumar	Hindi	3 hours
<i>Pather Panchali</i>	West Bengal Govt.	Benagli	2 hours
<i>Hindustan Hamara</i>	Paulzils	Hindi	3 hours
<i>Paradesi (35 mm.)</i>	Indo-Soviet Production	Hindi (Colour)	3 hours
<i>Yatrik</i>	New Theatres	Hindi	3 hours
<i>Pukar</i>	Minerva Movietone	Hindi	3 hours
<i>Children of Hiroshima</i>	Contemporary Films	English	85 minutes
<i>Farrebique</i>	Brandon	French with English subtitles	85 minutes
<i>The Bicycle Thief</i>	P.D.S. (ENIC)	Italian with English subtitles	89 minutes
<i>Brief Encounter</i>	Ciné guild	English	70 minutes
<i>Broken Jug</i>	FTM	German with English subtitles	80 minutes
<i>Ivan the Terrible</i>	Contemporary Films	Russian with English subtitles	99 minutes
<i>L'atalante</i>	J. L. Nounez	French with English subtitles	90 minutes
<i>Naught for Behaviour</i>	Arvi Films (Zero de conduite)	French	45 minutes
<i>Yukiwarisoo</i>	H & F	Japanese with English subtitles	120 minutes
<i>One is One</i>	Ancona	Silent	85 minutes
<i>Time in the Sun</i>	Contemporary Films	English	75 minutes
<i>The Childhood of Maxim Gorkey</i>	Sovexport	Russian with English subtitles	110 minutes
<i>My Universities</i>	Sovexport	Russian with English subtitles	104 minutes
<i>Battleship Potemkin</i>	Sovexport	Silent with English subtitles	55 minutes
<i>Kameradschaft (Comradeship)</i>	British Film Institute	English	16 minutes
<i>Louisiana Story</i>	Production and Direction—Robert Flaherty	English	84 minutes

N.B.—Paradesi is in 35 mm. The rest of the films are in 16 mm., and are available in the Central Film Library for students engaged on research projects connected with film appreciation.

the use of non-projected visual aids. In the village schools it is more than realized that only a beginning can be made with the help of charts, maps, and graphs, etc., due to the non-availability of electricity and non-accessibility of mobile cinema units.

School Broadcasting in India

There has always been a strong oral tradition in India. Knowledge was transmitted from generation to generation by word of mouth. There was no script, no paper, and no printing. Only *shruti* or the spoken word prevailed. Writing emerged later, and the Vedas, Granth Sahib, and the Holy Koran were written. The ancient drama and 'Natak' of India, which survive in India to this day, and the *Bhajans*, *Kirtans*, and folk songs (which are usually recited and sung) are highly appreciated in rural and urban schools. One is reminded of a story in the *Upanishads*. A boy goes away to study under a *guru* (teacher) and comes back home very proud for he thinks he has learnt everything. But his father asks him: "Do you know anything about Brahma [The Creator]?" "I do not know anything about Him," the boy replies. The father then asks him to bring a glass of water and salt. "Put the salt in the glass of water and come to me to-morrow." Next morning his father says to him: "Will you please give me that salt?" "I cannot find it," says the son. "Now just as you cannot see the salt," says the father, "so also you cannot see Brahma either." This is an interesting and early instance of teaching through experience used in ancient times. Thus the light of learning was kept burning throughout the centuries, and there was a close relationship between the teacher and the taught through the spoken word.

The radio and gramophone follows easily in this tradition. The Directorate-General, All-India Radio, has agreed to produce, in consultation with the Ministry of Education, educational records. These 45/33 $\frac{1}{3}$ r.p.m. records will be distributed to higher secondary schools. Also the *Linguaphone Series* for teaching is being planned by the Ministry of Education.

Educational broadcasts of an informal character have been in existence in India since January, 1929. Even before the All-India Radio came into being, the Madras Corporation transmitted programmes for the primary schools. But it was only in 1939 that the All-India Radio stations were asked to prepare school programme schedules in collaboration with state educational authorities.

At present twenty-one out of the twenty-seven AIR stations provide broadcasts to schools. These programmes are directed mainly to

secondary school students. The Madras station is unique in catering for primary school students as well.

Consultative panels advise the radio stations on school broadcast problems generally and on programme planning in particular. A consultative panel for educational broadcasts is attached to each of the stations broadcasting to schools.

Most AIR stations distribute (free, or at a nominal cost) pamphlets giving details of the programmes. An increasingly greater role is being given to teachers in the planning of these programmes and in actual live broadcasts. Planning sub-committees contribute to progress in school broadcasts on languages, social studies, music, science, mathematics, civics, and so on. School broadcasts are radio's contribution to education. They set up, both for students and for teachers, standards of speech and performance. They tap talent from a much wider area and bring to the inadequately equipped and the far-flung schools the advantage of listening to stimulating programmes. School broadcasts are not replicas of class lessons. AIR is working to make programmes richer and more suited to the needs and abilities of the listener and hope they will soon become a feature of classroom activity in every school.

At present, the twenty-one stations listed below are putting out school broadcasts; of these, twelve originate programmes, while others relay them. The service is mostly regional, but plans for putting out a few national programmes every term are under way. AIR broadcasts to schools in thirteen languages. The number of listening schools on 31st August, 1957, was 9,124. And in 1959 there was a very encouraging increase in the number of school licences.

<i>Name of the Station</i>	<i>Date of Commencement</i>	<i>Name of the Station</i>	<i>Date of Commencement</i>
Delhi	3 Oct., 1938	Nagpur	6 July, 1953
Bombay	Nov., 1938	Madras	Oct., 1940
Poona	19 Nov., 1956	Tiruchirapalli	Oct., 1940
Rajkot	28 Nov., 1955	Ahmedabad	July, 1954
Calcutta	May, 1947 (restarted)	Baroda	—
Trivandrum	15 Oct., 1951	Vijayawada	Oct., 1940
Kozhikode	—	Hyderabad	5 July, 1954
Patna	7 July, 1952	Jullunder	3 Jan., 1955
Lucknow	11 Feb., 1952	Bangalore	11 Oct., 1954
Allahabad	—	Gauhati	4 May, 1957
		Jaipur	8 July, 1957

During the "Seminar on School Broadcasts" held in co-operation with the B.B.C., 9-18th December, 1957, at New Delhi, the late Maulana Abul Kalam Azad, Minister for Education and Scientific Research, gave the following special message:

Radio and television have created a new medium of education which we have not yet fully utilized. Like the printing press, radio and television also mark a revolutionary advance in educational practice. If we can fully utilize radio and television, we can effect very great changes in our schools. The best teachers of the country can reach far wider numbers than is possible to-day. Lectures and books can be largely supplemented by radio, though there should be no question of the one supplanting the other. There is after all no substitute for a really good teacher, but just as books have been an aid to him, radio and television can also become his useful instruments.

Schemes have been formulated for inclusion in the Third Five-Year Plan for the further development of audio-visual education. They fall into three main categories; namely (a) the central audio-visual schemes, (b) the centrally sponsored schemes, and (c) the centrally aided schemes.

These schemes were carefully examined at the third meeting of the National Board for Audio-Visual Education in India.

The National Institute of Audio-Visual Education

India, like other nations, has its quota of far-sighted educators who are convinced that audio-visual education, given recognition, support, and leadership, can contribute significantly to the improvement and acceleration of India's educational programme.

Therefore, in 1959—under India's second Five-Year Plan—the Ministry of Education, in co-operation with the Technical Co-operation Mission in India, established a National Institute for Audio-Visual Education. The latest in audio-visual equipment, costing \$195,000² (Appr. Rs. 9¼ lakhs), will be provided by the Technical Co-operation Mission. Its services include:

(i) Training instructors and lecturers of teacher training institutions in the selection, preparation and use of audio-visual instructional material and the organization and administration of audio-visual problems connected with education.

(ii) Conducting research in the use and evaluation of various instructional aids;

(iii) Developing and producing new and inexpensive mechanical and non-mechanical audio-visual aids; and

(iv) Serving as a clearing-house for information about the latest techniques and improvements in projected and non-projected aids.

Its facilities for training personnel and for the production of instructional materials include: (1) a workshop; (2) a print shop; (3) a photo laboratory; (4) mobile audio-visual units; (5) a large auditorium; (6) a specialist library; and (7) a museum room.

² £1 = \$2.80.

It will run a short-term course of two-and-a-half months' duration and a long-term course running for thirty-six weeks.

Thus the National Institute of Audio-Visual Education is a further milestone in the improvement of mass-communication media. That India needs well-trained teachers for millions of classrooms is an accepted fact requiring no elaboration here.

Research in the Institute will provide systematic answers to many knotty problems connected with education.

Journals

Audio-Visual Education is published quarterly in January, April, July, and October by the Central Ministry of Education. Since April, 1959, a Hindi Section has been included for the benefit of Hindi-reading teachers. It aims at fostering among teachers and social education workers interest in the use of audio-visual techniques in education. It gives the latest information about the Central Film Library of the Ministry of Education. It provides a forum for teachers and social education workers to discuss and to share their day-to-day experiences in the audio-visual field. Its circulation both within and outside India is increasing rapidly.

Instructional and Teaching Films

Under its various programmes, the Ministry of Education sponsors classroom films every year. They are produced at the Films Division, Bombay, of the Ministry of Information and Broadcasting. They are produced in English and Hindi first. Encouragement is also given to private producers. Documentary films are made in fourteen languages, a reflection of India's multilingual situation. Exchange and dubbing of films with foreign governments and their subsequent dubbing are done with the help of the Ministry of Information and Broadcasting.

Negotiations with the Ordnance Factory, Dehra Dun, are proceeding to manufacture 35-mm. filmstrip projectors on a mass scale. Every effort will be made to produce the projectors cheap enough for educational institutions.

Books

The printed word is the most significant symbol of the modern age. Reading material is not only the fabric of human development, but also the main foundation on which a sound educational system can be built. To erect this complex edifice the Ministry of Education is bringing together authors, publishers, printers, booksellers, and

librarians. In particular, the public libraries, popular vehicles for communicating knowledge, will have to play an important role. India is so large—a sub-continent with the world's second largest population.

Practically everyone agrees that the textbook occupies a very important place in education. The problem is vital in India to-day, because the country is in a transition period in which both subject-matter and methods of teaching are in a state of flux—education is a state responsibility and the selecting of textbooks is handled in different ways by the different states. In general, the final selection of textbooks is done by a textbook committee.

The suitability of a book is discussed with reference to the following points: (1) the degree to which it conforms with the requirements of the syllabus; (2) the number and suitability of the illustrations; (3) the size and type of paper; (4) the quality of paper used; (5) the number of pages; (6) the binding and general set-up; and (7) the price of the book.

In India, the cost of a primary school book has to be very low in order to reach the hands of the low-income groups. Consequently the technical matters, like the quality of paper and the number of illustrations, are not always satisfactory. Therefore, the textbook committees usually lay down certain regulations. Of course, the illustrations are not always very artistic or aesthetically perfect, but they do satisfy the not-too-critical child.

In most Indian schools, the textbook is the only tool in the hands either of teacher or student. The teacher teaches from the book and the student studies it. Often very little else is available. This is especially true of many rural schools in India and throughout the world. In the urban schools, other audio-visual aids can be used.

Mainly for financial reasons, the classroom library is not very common even in some very good Indian schools. But most schools do have a library.

The Indian National Scientific Documentation Centre (Insdoc), which was established in 1952 by the Government of India with the technical assistance of UNESCO, provides a complete range of documentation services, but of its six main functions one is to supply photocopies or translations of articles required by individual workers. The photo-reproduction section of *Insdoc* can make photographic copies (either on microfilm or as positives) of scientific articles, diagrams for post-graduate theses, and so on. The centre also has a photo-offset printing unit for the publication of its bibliographical periodicals.

Television in India

Television is the new prima donna of social education in Delhi. The President of India formally inaugurated the TV programmes in New Delhi on 15th September, 1959.

The All-India Radio has made arrangements for puppet shows on television. In India the art of puppetry has been popular from ancient times. AIR thinks that many features of modern puppet art can be incorporated into the Indian tradition to make the puppets 'live'.

The National Institute of Audio-Visual Education will try out closed-circuit educational programmes in the near future.

At first, TV programmes will be seen in and around Delhi only—up to a radius of twelve miles or so. Twenty-one tele-clubs have already been organized in and around Delhi, and particularly in community welfare centres located in rural and urban areas. These tele-clubs represent the extension to the field of TV viewing of the principles behind organized community listening. Every tele-club will not only view programmes but also have free and informal discussion of the contents of programmes. A link will thus be established between the community centres and the TV unit of All-India Radio.

The Future of Audio-Visual Education in India

Audio-visual materials of instruction spread steadily during the first and second Five-Year Plans of India. Plans to use them are included in the third Five-Year Plan. This problem will continue until the idea of audio-visual aids is widely accepted in education at the primary, secondary, and university levels.

Classroom blackboards, sand tables, wall maps, puppet shows, shadow plays, and other traditional visual aids receive more systematic attention along with modern audio-visual aids like paper sculpture, cut-out and jump-out pictures, study kits, books, dioramas, flannelgraphs, poster-making by silkscreen process, school broadcasts, films, filmstrips, and television, and so on. An Einstein can make a contribution to astronomy by simply manipulating mathematical symbols on a piece of paper. Educators realize that a child will learn more by looking at the stars. Good teachers in India to-day are attempting to balance their teaching programme by using the potential of each method. The Ministry of Education is constantly exploring ways of making the new aids supplement and sharpen traditional tools. The wealth of teaching materials available to the schools to-day might be compared to the many instruments in an orchestra. The teacher, as the director, calls on each one as it is needed to contribute to the harmony of the whole. Both textbook

partisans and exponents of audio-visual materials are coming to a fuller realization that both are vitally important and neither is self-sufficient.

Conclusions

For historical, geographical, social, and economic reasons, audio-visual aids have not been integrated in school programmes. There are, for example, still hundreds of villages where no electricity is available and therefore projectors cannot be used.

The greatest single influence in the spread of audio-visual education is the systematic, far-sighted policy of the Ministry of Education under its capable Minister, Dr. K. L. Shrimali.

India is a multi-lingual country and the question of production and distribution of non-projected aids will have to be worked out by the National Institute of Audio-Visual Education.

The sand tables of yesteryear, the blackboards and chalkboards, bulletin boards, school museums are receiving the attention of Indian scholars in teacher training institutions. The study of factors affecting the establishment of audio-visual aids service centres in the various states, training colleges, educational institutions, community project centres, social educational organizations will receive much from the newly established National Institute of Audio-Visual Education. In addition, it will devote special attention to curriculum analysis as a basis for selecting and providing audio-visual materials to schools and other educational organizations throughout India.

Finally, the encouragement given to audio-visual education by the Prime Minister might be mentioned. Prime Minister Nehru's message of 26th January, 1958, was printed in the *Audio-Visual Education Journal*, Vol. I, No. 4, January, 1958, published by the Ministry of Education. He said :

I am glad to know that audio-visual aids are being gradually introduced in our educational system. There can be no doubt that this method is of great help. It should be encouraged.

HOMAI JAL MOOS and E. A. PIRES.

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Media of Mass Communication in Ghana

GHANA is a small country, roughly rectangular in shape, lying between the latitudes of 5° north and 12° north and the meridians 3° west and 2° east, with an area of approximately 100,000 square miles and a population of five millions. The economy is basically agricultural, cocoa being the major export. Though comparatively wealthy by West African standards—the average income per head of the population being in the region of £54¹ compared with Guinea's £15—it is, when contrasted with more developed areas, poor. It is a country of small villages, packed closely together in the central and southern forested areas and scattered in the northern savannah, rather than of large towns; of peasant farmers rather than paid employees, although the number of the latter has increased greatly since the end of World War II.

Development in Ghana is proceeding at an increasing pace. Since World War II, road and rail communications have been immensely improved both in coverage of the country and in quality; a new port is nearing completion; small factories are beginning to be established; rural water supplies improved; hospitals and clinics built, and the supply of electric power extended. Plans have also been made to exploit the country's mineral resources in a more intensive manner than hitherto. The extent of this development can be seen from the second development plan for the years 1959–64, which forecasts a capital expenditure of 324 million pounds.

This development is reflected in education, not merely the education of the country's youth but also of its adults.

In 1951 free primary education was introduced, and since then the number of children in primary schools has more than doubled.² Although fees are charged for middle and secondary school tuition, nevertheless there have been equally significant increases in the middle school and secondary school populations, as can be seen in Table I.

¹ £1 = \$2.80.

² Primary education begins at the age of 6 and lasts for six years. Children then proceed to middle schools, which offer a four-year course, whilst the great majority of pupils enter secondary schools by means of a competitive examination at the end of the second year of middle school.

TABLE I
CHILDREN ATTENDING SCHOOL IN GHANA

	1950	1958
Primary . . .	211,994	471,020
Middle . . .	59,960	139,801
Secondary . . .	6,162	13,196

Further, eleven new teacher training colleges have been opened between 1950 and 1959, and four more are to be opened in 1959-60, making a total of thirty-six. The number of teachers in training has increased from 1,777 in 1950 to 4,055 in 1959.

Schools, Teacher Training Colleges, and other Educational Institutions

This rapid expansion has strained both financial³ and professional resources. Necessarily, most emphasis has been laid on the provision of school buildings and the supply of teachers, with the consequence that the primary and middle schools as yet have few modern teaching aids, although the larger secondary schools are well equipped. Equally, the low average income means that many parents have considerable difficulty in buying the textbooks required even for primary schools.

School textbooks are selected from an approved list drawn up by the Textbooks Committee of the National Advisory Council for Education, which examines all textbooks and approves those whose content is in keeping with current syllabuses. Since 1950 there has been a considerable improvement in the quality of textbooks, with more emphasis being placed on local content and children's interests and in the presentation of material—especially in the use of coloured illustrations, which were almost unknown up to 1950.

No primary schools as yet possess movie or filmstrip projectors, radios, or tape recorders. With regard to other teaching equipment all schools have blackboards of varying quality, and a good proportion of schools have some models—used mainly for arithmetic and social studies. Many teachers also make posters for display purposes. Partly due to the high percentage of untrained teachers (45 per cent in 1959) and to limited funds, the primary schools must be regarded as still being under-equipped, and will continue to remain so until the pressure of absorbing the very large growth of the pupil body is eased.

³ The annual grant per pupil for primary schools for recurrent expenditure is £4 per head per annum, and that for middle schools £6.

The situation in middle schools is somewhat better. Since 1958 the Ministry of Education has made available annual grants of £20,000 for the provision of books for school libraries, the books being purchased by the department and issued to schools. As far as can be estimated, about one-third of the schools have either radio sets or rediffusion boxes. Programmes of the Ghana Broadcasting Department, such as the news and, in some cases, the teaching of English, are used. On the whole, though, it is doubtful whether the radio as yet is making any considerable impact on teaching methods in middle schools. As far as the provision of other equipment is concerned the situation is similar to that in the primary schools, although many schools possess maps and globes and make use of posters issued by various government agencies, such as the Ministry of Information, which issues a weekly newspaper, and the Ministry of Agriculture. Schools in the Accra region are also able to get similar material from time to time from foreign embassies. Some middle schools in the proximity of training colleges also have occasional access to movie and filmstrip projectors, which are mainly used as aids in the social studies or for entertainment.

In secondary schools the situation is more varied. There are two categories of schools, the first of which consists of government and approved schools—that is, schools financed by government or grant-aided by central government or the local authorities. In the second category come private schools.

A questionnaire sent to all secondary schools revealed the following:

TABLE II
AUDIO-VISUAL AIDS
GOVERNMENT AND APPROVED SECONDARY SCHOOLS
(Number of Schools—38; Number Replying—14)

	<i>Possess or have access to</i>	<i>Do not possess or have access to</i>
Movie projector . . .	9	5
Filmstrip projector . .	7	7
Radio	8	6
Gramophone	10	4
Tape recorder	3	11

There are also differences in the ways in which these aids are used. In general, movie films are used for one or more of the following pur-

poses: entertainment, history and geography, science and health, English; and the rate of use varies from occasionally to about two hours a week. Several schools reported that the use of movie films was restricted for educational purposes in their area due to the fact that electricity was only available in the evenings. Filmstrips show the same range of utilization, and are mainly used for science and history and geography teaching.

The radio is used for current affairs, history, geography, literature and, more recently, for spoken English. Gramophone records are used for musical appreciation, spoken English, and literary appreciation, whilst those schools possessing tape recorders use them for speech training and singing. These secondary schools, in addition, generally have well-equipped libraries and adequate supplies of maps and charts, scientific models, and other science teaching apparatus.

Private secondary schools, twenty-four in number, are less well equipped, and their standard resembles much more that of the middle schools. Only two reported the possession of movie projectors, four had filmstrip projectors, and six had gramophones.

Teacher training colleges all possess movie and filmstrip projectors, radios, and gramophones, and show the same variation in utilization as the government and approved secondary schools. Several of the newer training colleges have also indicated that their libraries are still inadequate and that they are desirous of obtaining additional funds to increase the number of books in them.

Within the teacher training colleges considerable emphasis is being placed on method courses, on the making of visual teaching aids such as posters and small models, and students are also instructed in their use.

The University College of Ghana and Kumasi College of Arts, Science and Technology have been generously treated by the government, and adequate funds have been made available to teaching departments for the purchase of audio-visual aids, which are widely used. These range from mathematical models to tape recorders, from movie filmstrip projectors and epidiascopes to maps, charts, and globes, from mimeographed materials to sets of pictures. The University College Library, which subscribes to some 1,600 periodicals, now has about 140,000 books, and it is envisaged this will grow to about 250,000 in the foreseeable future. The College's Institute of Extra-Mural Studies, with its book-box study course scheme, has extended the work of the college to many parts of the country.

Department of Social Welfare and Community Development

Mass education began in 1948, and the work of the Department of Social Welfare and Community Development has developed consistently. At the present moment the work of the department, apart from social welfare activities, falls under the following headings:

- (1) Adult literacy.
- (2) Work among women on home economy lines.
- (3) Self-help construction projects.
- (4) Extension and adult education campaigns.

The extent of its literacy work can be estimated from the following table:

TABLE III
MASS EDUCATION STATISTICS, 1957

	<i>Number</i>
Towns in which mass literacy classes were held	1,351
Voluntary leaders registered	2,723
New literates produced from literacy classes	17,462
Learners registered for vernacular literacy certificates	30,222
Recipients of advanced vernacular certificates.	5,112
Women's classes formed during the year	357
Women who were in the women's classes at the end of 1957	24,232

The following selection of its extension and adult education campaigns reveals an additional range of the education activities being undertaken.

All Regions:

- (1) Community development project work.
- (2) Young farmers' clubs.
- (3) Road safety campaigns.
- (4) Formation and encouragement of community development associations.
- (5) Rural builders' courses at rural training centres.
- (6) Voluntary leaders' courses.

Cocoa Area:

Cocoa campaign.

Northern Territories:

- (1) School building programme.
- (2) Frafra Resettlement Scheme.
- (3) Dry season gardening.
- (4) Manure and mixed farming.
- (5) Extension of rice fields.

Ashanti:

- (1) Young farmers' training course.
- (2) Health campaign.

Trans Volta/Togoland:

Health campaign.

Ga District:

Assistance with Tema Young Farmers' Settlement Scheme.

From its inception this department has given close attention to methodology and has used audio-visual aids with great success in stimulating interest, demonstrating skills, and creating favourable attitudes towards new habits, techniques, and responsibilities amongst both literate and illiterate adults.

For its mass education work the department uses the Laubach technique, and distributes sets of readers and follow-up materials through its regional teams and book vans. In the fields of child health and agriculture, films, produced in some cases by the Ghana Film Unit, e.g. *Amenu's Child*, or by officers of the department, which set up a visual aids section in 1956, have been used to considerable effect.

The nature of the media and their methods of use are perhaps best typified by a description of their use in one campaign—the Cocoa Campaign—which, undertaken in conjunction with the Agricultural Department, began in 1956 and still continues. Initially a conference, organized by the Institute of Education, University College of Ghana, was held for senior officers of the two departments. Demonstrations in the use of posters, flannelgraph, puppetry, village drama teams, movie films, and filmstrips were given with data relating to the cocoa campaign. As a result of this campaign, posters and flannelgraphs were produced to illustrate both the techniques and results of eradicating cocoa diseases, methods of planting, and elementary agricultural economy. Silent movie films were produced by the department demonstrating proper methods of planting and the results of right and wrong methods of cultivation, and vernacular commentaries were broadcast. Drama teams likewise performed, and aroused great interest because of the local colour they were able to introduce. Finally, a recording of a song about the cocoa campaign to a popular dance rhythm was freely distributed. The concentrated use of these aids, together with the more traditional methods of imparting ideas, has resulted in a highly successful campaign.

The department has recently given much attention to the problem of producing films suitable for unsophisticated audiences and, with the use of stripped film, the omission of background music, and use of

slower tempo than is normal, feels that it is achieving considerable success and at much lower production costs than hitherto.

Department of Information Services

The Department of Information Services is another agency responsible for communication. Its activities can be listed:

- (1) The production of reading material in local languages.
- (2) The production of reading material in English.
- (3) The production of films.
- (4) The bringing of films to rural audiences.

The Bureau of Ghana Languages, formerly the Vernacular Literature Bureau, came under the aegis of the department in 1957. From its inception in 1951 it has worked closely with the Department of Social Welfare and Community Development, producing readers and follow-up reading material such as newspapers and booklets. Table IV lists the newspapers produced in 1958.

TABLE IV
GHANA LANGUAGES BUREAU
NEWSPAPERS

<i>Where Produced</i>	<i>Language</i>	<i>Circulation</i>	<i>Frequency</i>
Accra	Twi	12,000	Every 2 weeks
Accra	Fante	6,000	Every 2 weeks
Accra	Ewe	6,000	Every 2 weeks
Accra	Nzema	3,000	Every 2 weeks
Tamale	Kassem	750	Every 2 weeks
Tamale	Dagbane	750	Every 2 weeks

Up till 1958 the subjects mainly dealt with in booklets for new literates covered the fields of health, citizenship, and cultural affairs. By 1957, however, it was realized that there had been a considerable fall in the sale of such books over the previous three years. In 1959 the Bureau of Ghana Languages carried out an investigation of the reading habits of adults,⁴ and made, among others, the following recommendations:

(1) That the Bureau should publish an increased amount of informational and educational material on a variety of subjects, in co-operation with the various departments of government. For example, here one aim might be to help these departments to prepare communities for the acceptance of new ideas.

⁴ *A Study of the Reading Habits of Adults in Ashanti, Southern Ghana and Trans Volta/Togoland* (Ghana Languages Bureau, Accra, 1959).

(2) That there be an increase in the type of reading-matter which is carefully designed to foster the wholesome growth of national unity and of a wise and well-advised public.

(3) That the Bureau should aim at developing further its activities in documenting information and in acting as a clearing house for information pertaining to the languages of Ghana.

(4) That the Bureau continue to include, as one of its functions, that of encouraging creative writing and of helping authors to find outlets for their literature.

(5) It is also realized to the full that the vernacular and English are complementary as a language equipment which will make for real advance.

As a result of the last recommendation, the Bureau has already produced a small book of poetry in which each poem is printed in both the vernacular and English.⁵

The distribution of the literature produced by the Bureau is carried out not only by six book vans, but also by some 3,000 agents, school teachers, traders, farmers, and the like, on a commission basis.

The Department of Information Services also publishes in English. Table V lists the types of material and the size of editions.

TABLE V
PUBLICATIONS IN ENGLISH, 1958

Name	Type	Edition	Frequency
New Ghana	Newspaper	50,000	Weekly
Northern Region Weekly	Newspaper	10,000	Weekly
Ghana and the United Nations	Booklet	50,000	—
Brief Guide to Ghana	Booklet	10,000	—
Prime Minister's Visit to Nigeria	Booklet	10,000	—
Posters	—	6,000	Monthly
Display sheets	—	As and when required	

The newspapers contain eight pages of Ghana news, commentary, and official statements, and are distributed to schools, central and local and government offices, and the like. The booklets are sold through agents, and posters are prepared on themes representing various governmental activities and campaigns; a recent one, for example, concerns the forthcoming census, a previous one the changing of West African currency into the recently introduced Ghanaian currency.

The Ghana Film Unit produces both news films and documentaries, the latter often in conjunction with social welfare and community

⁵ *MMO:Fra An Wonsen (Poems of Childhood)* (The Bureau of Ghana Languages, Accra, 1959).

development activities. The cinema section has a large and varied collection of educational, documentary, and entertainment films, which are made freely available to educational and other institutions as well as being shown on its own programmes. The cinema section's activities in this sphere are described in Table VI.

TABLE VI
INFORMATION SERVICES FILM STATISTICS, 1958

Number of vehicles	32
Number of performances	2,383
Estimated attendances	2,321,598

A normal programme is usually arranged on these lines:

Newsreel	10 minutes
General interest film	10-20 minutes
Main teaching film	20-30 minutes
Supporting teaching film	10 minutes
General interest film	10 minutes
Entertainment film	10-20 minutes

Library Services

The Ghana Library Board has libraries in the larger towns, each of which contains a children's section. Subscriptions are low, and schools are also able to use the Board's book-box scheme free. Surprisingly, the book-box scheme has not as yet been used by schools to the extent that might be expected where schools are so poorly equipped with reading material.

Radio Broadcasting

The Ghana Broadcasting Department has a country-wide coverage obtained through both radio and rediffusion systems. Programmes are

TABLE VII
SCHOOL PROGRAMMES

<i>Subject</i>	<i>Directed to</i>	<i>Hours per Week</i>	<i>Number of Broadcasts</i>
Spoken English	Teacher colleges and junior secondary classes	40 mins.	2
Geography	Teacher colleges and middle secondary classes	30 mins.	2
Science	Teacher colleges	30 mins.	2
English Literature	Senior secondary classes	30 mins.	2
Current Affairs	Teacher colleges and senior secondary classes	30 mins.	2
Methodology	Teacher colleges	30 mins.	2
TOTAL		3 hrs. 10 mins.	12

broadcast for about a hundred hours a week. In 1956 a schools section was begun, and programmes for secondary schools and teacher training colleges commenced on a limited scale. Table VII summarizes the present position.

Non-Government Agencies

Publicity and educational materials of various kinds are also made available from time to time by embassies, commercial companies, and other organizations, a sample of which are given in Table VIII. It must be remembered, however, that, by and large, their contacts are limited to larger towns, except in the case of mobile cinema vans.

TABLE VIII
OTHER AGENCIES ENGAGED IN INFORMATIONAL ACTIVITIES

<i>Name</i>	<i>Cinema Vans</i>	<i>Film Library</i>	<i>Posters</i>	<i>Exhibi- tions</i>	<i>Libraries</i>	<i>News Sheets</i>
British Council	*	*	*	*	*	—
U.S. Information Services	*	*	—	*	*	*
Indian Embassy	—	—	—	—	—	*
Shell (Ghana) Limited	—	*	*	—	—	—
Catholic Youth Organisation	*	—	—	—	—	—

Future Developments

The Ghana Government has recently decided to introduce television, initially in the Accra area only, but eventually with a wider coverage. Plans are as yet in the early stages of preparation, and it still remains to be seen what the final outcome will be. Nevertheless television may, if sufficient schools are within receiving distance, play a significant part in bringing specialist teachers and a wider range of activities to schools lacking both adequate staff and equipment, particularly if it should be decided to devote a fair amount of programme time to educational purposes. The task of training teachers to use such programmes will call for a special effort on the part of those who are responsible for teacher education.

A. TAYLOR.

Recent Developments in Denmark

At the outset one general statement may be made to indicate the main drift of this article. Although the manifold educational potentialities of modern mass-media have been fairly widely acknowledged in this country since about 1930, these teaching aids have only been used on a somewhat modest scale so far. This may be inferred from the following facts:

There are about 4,500 schools (in the widest sense of the word) in the country. Since 1932 there has been a government-sponsored production and distribution of educational films, and since 1938 a regular film service for schools operating through the State Film Centre, which offers a wide variety of films at low rentals. The current annual distribution of films through this channel to schools, cultural associations, and, in fact, all sorts of educational institutions, amounts to about 40,000. Foreign embassies and a few private and semi-private film-distributing organizations also provide their share of educational films, but this does not amount to much in comparison with that of the State Film Centre.

The Present Situation

A special broadcasting service for schools has existed since 1927. At present it transmits about 300 new programmes a year for primary and secondary schools, plus a few for teachers. These broadcasts, which cover a wide range of topics bearing on practically all school subjects, are on the air during school hours and are intended for direct reception in the classroom. Their usefulness has been greatly increased through the establishment, during the last five years, of a number of tape-recording centres, which copy all school radio programmes and lend their recordings to schools on demand, free of charge, thus making freedom of scope and flexibility of planning possible for teachers who wish to employ school radio material. This activity is now carried on by about ten L.E.A. (Local Education Authority) recording centres and the Ministry of Education Tape Recording Centre, which has, moreover, recently begun to offer recordings of UNESCO programmes as well. The latter centre distributes about 2,250 recordings per year. The school radio management estimates that only about 30 per cent

of all school pupils hear the school radio programmes, whether on tape or directly.

There is no television for schools. Its establishment in the future is taken for granted, and is being prepared for by storing of films, but no definite plans have been made as yet.

As for other audio-visual aids, like gramophone records, slides, and filmstrips, they are at present available only through a number of private commercial firms, and it is thus a little difficult to find out how extensively they are being used, as statistical information is both hard to come by and difficult to interpret correctly.

New Plans

However, a new Education Act was passed in 1958 involving a thorough re-casting of the national school system and a partial re-definition of the aims of school education. Accordingly, a committee has been set up to revise school curricula so as to make them meet the requirements of the new law. It is expected that in this process audio-visual aids of all kinds will be put properly on the map so far as teaching is concerned.

In any event, many educators agree that this would be desirable. They are mostly teachers who have themselves experimented with modern audio-visual aids in their teaching. Their work in this field seems in particular to have led to the following conclusions.

(1) These teaching aids are undoubtedly very effective because of their accuracy, vividness, and evident power of appeal to the imagination and to reflection. Moreover, they often facilitate new combinations of subject-matter and new student activities as, for example, when classes correspond with their opposite numbers abroad by means of tape recordings.

(2) These great advantages are only fully exploited, however, when these media are systematically integrated into the scheme of work for the class in question. At present this fact does not appear to be generally recognized in Danish schools.

(3) On the other hand, a slapdash, uncritical use of technical contrivances with no plan of progression and no time allowed for preparation and subsequent discussion is liable to have a dulling if not actually antagonizing effect on pupils.

(4) It is obvious that pupils will become increasingly accustomed and sensitive to the distinctive language of modern mass-media. The school can hardly afford not to turn that heightened awareness to account for education.

(5) Incidentally, the school has an opportunity here of forming habits of discrimination among the pupils in dealing with film, television, etc.

Thus it may do a little to live up to its responsibility in the era of automation to educate for leisure as well as for work.

To go on from these general assumptions to a practical development of modern audio-visual methods it seemed necessary to co-ordinate experience and efforts by means of an impartial consultative organization. So in 1957 a group of practitioners from all forms of teaching established the Danish Audio-Visual Society (DAVS). This is an entirely non-commercial body. Its main aims are to assist and advise those who use technical audio-visual aids for research and education in the widest sense, to establish contacts between such individuals and institutions as are interested in these matters, and to ease the path of international co-operation in this sphere through contacts with similar associations abroad.

In the attempt to carry out these functions the society is engaged in a variety of specific tasks. Some of these are listed here as they may indirectly throw some light on the general situation in the audio-visual aids field. Thus the society:

- (1) arranges demonstrations of audio-visual aids at teachers' conferences (regional, national, or international);
- (2) is co-operating with the Librarians' Association, which has taken the initiative for the establishment of a central national archive of educational recordings;
- (3) is building up connexions with similar organizations in England, France, Germany, Norway, and Sweden;
- (4) acts as an advisory body to the commercial producers of audio-visual aids by calling in specialists to criticize their products;
- (5) is drawing up the recommendations it has been asked to submit to the curricula committee under the new Education Act;
- (6) is planning a publication containing information about new audio-visual aids, bibliographies, discographies, reviews, etc.;
- (7) is appealing to the authorities to find an effective way of implementing the section in the teachers' training college law of 1955 which emphasizes the necessity of instruction in the handling of technical audio-visual aids (there have been certain difficulties here owing to a lack of funds and qualified instructors); and
- (8) is having enquiries and experiments carried out by a specialist in order to find out whether or how far useful educational films can be extracted from existing commercial publicity documentaries.

BENT SUNESEN.

FOR FURTHER READING

Børge Dybmose, *Skoleradio—stimulering til aktivitet* (Unge Pædagoger, February 1949, Copenhagen).

Dines Hansen, *16 mm smalfilmengiveren og dens anvendelse i undervisningens tjeneste* (Copenhagen, 1951).

Nils Håkanson, *Bild och Ljud i Undervisningen* (Stockholm, 1953).

Monrad M. Håtoft (ed.), *Se—hør—lær. Om de audio-visuelle hjelpemidler i undervisning og opplæring* (Oslo, 1954).

Ebbe Neergaard, *Filmkundskab* (Copenhagen, 1952).

Tekniske Undervisningsmidler (Special Issue G of *Unge Pædagoger*, 1954).

Norges kirke- og undervisningsdepartement, *Innstilling fra komiteen til å utrede spørsmål som oppstår i forbindelse med bruken av audio-visuelle hjelpemidler i skolen* (Oslo, 1958).

Statens Filmcentral, *Skolefilmkatalog* (Copenhagen).

Undervisningsministeriets Båndcentral, *Arkivoversigt* (Copenhagen).

Danmarks Skoleradio, *Programmer* (Copenhagen).

CHAPTER EIGHT

The Organization and Use of New Media in French Education

By the end of the nineteenth century the Ministry of Education was already organizing the distribution of lantern-slides, and from 1910 onwards encouraged the production of the first educational films. After the First World War, radio programmes intended for use in schools made their first appearance. For more than the past ten years television for schools has been organized on a national scale. Thus, whenever it has been possible to bring new means of communication to the schools of France, the Ministry seems to have taken the necessary steps.

During the last few years, the rhythm of production and distribution of audio-visual aids has been very much speeded up. This has made necessary a continual expansion of the services engaged in such work. Consequently it is of interest to examine the position of audio-visual aids in French education, while at the same time attempting to find out the main lines along which this technique is developing as shown by plans either being put into practice or still being worked out.

Organization

Before examining in detail the position of audio-visual aids in the French education system, it is useful to look quickly at the structure of the latter and also at the main lines which govern its organization. This article is concerned only with the state system of education.

The part played by the state as represented by the Ministry of Education is decisive: the Minister of Education, helped by the Higher Council for Education, controls French educational institutions of all types, from nursery schools to the university. The state meets the financial needs of the universities and of the secondary and technical schools. It recruits and pays every member of every teaching staff. It finances the building of schools for secondary and advanced education, and provides a large part of the money necessary for the building and equipment of primary schools.

The syllabuses of educational institutions are drawn up by the Minister of Education in accordance with the advice given by the Higher Council for Education, which is made up of general inspectors, members of the teaching profession chosen by the unions, administrators, well-known educators, and representatives of the parents.

If exception is made of certain modifications and adaptations on a regional scale, the educational syllabuses are, in the main, identical all over the country. This tendency to uniformity has often been criticized, but it must at once be made clear that the instructions given by the Ministry are much less peremptory than has sometimes been said. More often than not recommendations are made rather than orders given. The syllabuses provide a framework of studies for each year of schooling, and within this framework the teacher has a certain freedom. Nevertheless, it cannot be denied that the syllabuses found in the French educational system are much more uniform than those found in most other countries.

It should also be noted that this standardization of the syllabuses in French education, which was perhaps a handicap at one stage in the development of the system, tends to ensure, in spite of the demographic, economic, and even political diversity of the different districts, an education of identical value, providing equal educational opportunities for all pupils. As far as audio-visual education is concerned this factor is an advantage rather than a handicap. Indeed, it makes possible systematic planning, not only of the production of audio-visual aids but also of their use. Much at this early stage depends upon the initiative of the members of the highly centralized administration. For example, because the needs of schools have been investigated and made known, it is possible to give priority to the production of audio-visual programmes which will satisfy the needs of the greatest number of pupils and teachers. Broadcasting both of sound and vision is a state monopoly in France, and the government allows the Ministry of Education to make use, at certain hours of the day, of the national broadcasting system. This again ensures that every school in France enjoys similar conditions.

In addition, when a series of programmes is broadcast at a certain moment in the year, the producers can be sure that the majority of the schools for which these programmes are planned have reached a stage in their studies enabling them to reap the greatest possible benefit from the broadcast.

The Administrative Structure

The structure of the services and the organization responsible for the production and the use of visual aids in French education is an exact reflection of the administrative organization found in the general system of education in France. Two closely connected bodies form the core of the central organization. They are known as the *Institut Pédagogique National* and the *Centre Audio-Visuel* of the *École Normale Supérieure* at St. Cloud.

The original centre from which the *Institut Pédagogique National* has developed, the *Musée Pédagogique*, was founded at the end of the nineteenth century in order to preserve documents connected with the history of education, and also to produce and distribute aids necessary to education. At the present moment it is a very important institute composed of various sections, among which is to be found the *Département des Moyens Audio-Visuels d'Enseignement*. Above all, the Institute is the centre of the *Commission Ministérielle des Moyens d'Enseignement*. The commission plays an important part in the detailed planning of series of audio-visual productions; it is composed of a large number of educationists engaged in teaching all sorts of subjects at various levels. In order to make its task easier, this commission is subdivided into a number of sub-committees to deal with the different subjects; for example, history and geography, physics and chemistry, biological science, modern languages, music, fine arts, etc. In addition, some sub-committees are concerned with technical subjects such as films and filmstrips, the use of sound, and of television.

This commission has a double part to play. On the one hand it examines audio-visual aids of every sort, already produced by French or foreign private industry. They are selected and eventually approved of by the organization. Indeed, schools within the state system in France can only buy and make use of visual aids which have been approved by the Ministry of Education. In addition, certain members of this commission act as educational advisers attached to certain productions, mainly in the realm of the cinema, of slides, and of television. The part played by this commission is mainly advisory, but very frequently the audio-visual services merely confirm the decisions of this particularly competent commission. Several technical services make profitable use of the work of this commission within the department for audio-visual aids. Namely, the service concerned with the use of films, filmstrips, slides, the service for television for schools, the service for broadcasts to schools, and the service devoted to the use of sound in education. Certain services help them all: they distribute pamphlets of all sorts, requisite apparatus, and give financial aid. They are controlled by the head of the department. The technical services ensure the production of audio-visual aids; they also provide the pamphlets asked for by the schools and reply to numerous requests for information. This department also controls the use of the money granted by the Ministry at a national level for the production and distribution of audio-visual aids.

The *Commission des Appareils Audio-visuels* (Committee for Audio-Visual Equipment) exists and is of an unusual nature. It is composed of a number of technicians and educators who examine with the greatest

care the different French appliances put on the market each year. It has worked out a list of the minimum requirements which any piece of apparatus must satisfy before it may be used in French schools. The effect of the work of this sub-committee has been most remarkable, for in a few years it has eliminated those appliances which did not come up to minimum requirements, and also, by successive modifications of its lists of conditions, it has induced the designers and the manufacturers continually to improve the apparatus put on the market. Thus the members of the committee have been careful not only to ensure the production of apparatus of exceptionally good quality of performance, but which also are strong enough to stand the wear and tear inevitable in schools.

In connexion with the department of audio-visual aids there are two organizations which are concerned with keeping copies of existing audio-visual aids. These are a film library and a central record library. In addition, there is a large distributing organization, the *Cinémathèque Centrale*, with headquarters in Paris, which arranges the distribution of educational films, either directly or by means of a network of film libraries in the different regions and districts of France.

The *Centre Audio-visuel*, set up in connexion with the *École Normale Supérieure* in 1947 has a threefold function. Those in charge of it have as their responsibility, on a national scale, research and teaching in the sphere of audio-visual methods in so far as they may be used for education. In addition they are responsible for experimental productions. In order to do this, a close connexion has been set up between a laboratory for advanced education attached to the *École Normale Supérieure* and a department of the *Institut Pédagogique National* which specializes in audio-visual aids.

In order to fulfil its threefold function, the *Centre Audio-visuel* has at its disposal a very varied group of people; teachers, research workers, technicians, all of whose complementary activities combine together in a particularly original way, most suitable to the French organization.

The primary function of the centre is research. This is carried on in different spheres; it is above all concerned with acquiring a better knowledge of the people for whom audio-visual aids are meant, and sponsors psychological and psycho-physiological research among the school population, from nursery schools to advanced students. Experiments are carried out in schools with prototype productions, which are progressively improved as a result of the reactions obtained. Other experiments concern the actual methods of using the different aids; the maintenance of a high standard in new methods of production is a major activity of the centre, as well as the use of audio-visual aids. Instruction is given at the audio-visual centre to a number of French

and foreign educationists, and to students who are carefully chosen and whose studies are completed by a special examination. This instruction has as its aim the training of experts and specialists in audio-visual aids so that there will be a qualified personnel in France, for the French territories outside France, and for foreign countries. The course of studies consists not only of classes, but also of numerous sessions devoted to practical work in the use and production of audio-visual aids. The practical work is not intended to train people to be competent producers of every type of visual aid, but to give to students sufficient basic knowledge for them to be able, in their turn, to undertake, to direct and to organize the production of audio-visual aids, or to train those who will make use of them. In this way the centre is seen to be a training school for future leaders in the sphere of audio-visual educational aids. In addition to these annual classes and practical work, the centre gives weekly classes intended for inspectors being trained at the *École Normale Supérieure* who will eventually become the leaders of primary education. In addition, teachers from the audio-visual centre give lectures in the provinces and abroad, organize courses of varying lengths intended for specialists, usually people belonging to some special category of educationists. Finally, the centre is responsible for the planning and working out of new audio-visual methods. Their productions can either be direct or indirect. Their direct productions can be seen when they provide, with the help of teams of specialized technicians, information and audio-visual material for use in advanced education, the material asked for by teams of research workers and, in addition, films and information which will amplify instruction in methods of teaching in both universities and training colleges. Moreover, the centre produces prototype films for use at all levels of teaching. This experimental production has played and still plays a most important part in French audio-visual methods, for this group directs and guides the production of various series of audio-visual aids which have remained in the hands of private companies. A large group is occupied indirectly with production; it helps to produce films made by educationists; it re-edits various films for educational purposes in suitably short lengths, and finally, arranges the dubbing or sub-titling of films and other audio-visual aids coming from abroad as part of exchange systems.

The experimental work done by the audio-visual centre has an influence over the whole sphere of audio-visual aids—posters, flannel-graphs, filmstrips, films, tape recordings, television, etc.

As part of the central organization of the Ministry of Education two more groups concerned in production and distribution exist. They are of less importance, since they are specialized and are concerned with

instruction given to future teachers in audio-visual techniques is superficial. In order to fill these gaps the lecturers in the *Centre Audio-Visuel*, with the help of the *Centres Regionaux de Documentation Pédagogique*, have turned their attention towards the organization of courses meant both for intending teachers and those already actively engaged in the profession.

Present Conditions

Before examining, both from the point of view of production and of use, the present position of audio-visual aids in French education, it will be useful to define what principles guide those who produce audio-visual aids, and perhaps even more important, the aims of those who use them, since the producers work in order to satisfy their demands. Most educationists consider that audio-visual aids should play a very modest, minor part. In no case should these aids supplant the teacher. They must remain ever-present and modest servants, always at the disposal of the teacher. Many teachers, therefore, use them especially as illustrations for the eye or the ear and still hesitate to integrate them in a systematic manner into their teaching.

Fortunately, an enlightened section of the teaching profession already sets a great store by audio-visual aids and finds in them much to enrich lessons. They give an especial welcome to audio-visual aids when they make it possible to infuse a breath of life into the classroom, when it is not possible to bring the class into direct contact with life. Thus these aids are expected to provide pictures of the outside world in the form of lasting information which is always there to be used. In addition, thanks to new techniques such as television, it is hoped to be able to bring things as they are actually taking place into the classroom. Finally, audio-visual methods are used whenever they increase perception of the outside world through eye or ear and even more when they make possible the sight or hearing of phenomena which would be inaccessible without their aid.

But it is difficult to generalize in this sphere, for the aims vary very much according to the way in which these aids are used, how well they are used, and also according to the type of school in which they are used.

Production

The methods of production vary greatly according to the different types of aid. Nevertheless, they have one point in common: those who produce these aids have the constant help of educational advisers who are usually members of the *Commission Ministérielle des Moyens d'Enseignement*; especially in the case of audio-visual material which

is produced directly by the Ministry of Education and its dependent services.

Aids not meant for use with projectors (wall charts, photographs, specimens, models, etc.) are produced almost exclusively by a large number of private firms which are usually connected with publishing companies, which also have special departments for this kind of production. The part played by the Ministry of Education is, on the one hand, to arrange for the examination of these aids by the competent sections of the Commission, and on the other hand, to provide advice for these companies, so that they may make constant improvements in their productions.

Mention must, however, be made of the direct contribution of certain state services, not only those of the Ministry of Education, and those of certain museums, but also and above all of the *Documentation Française*, an organization connected with the office of the Prime Minister which regularly edits series of photographs and slides.

Films, filmstrips, and slides are also edited by a large number of private companies for which the Ministry of Education thinks it sufficient to provide educational advice, by means of the Commission. It is, however, of interest to mention certain autonomous productions of the Ministry having as their aim either to fill in the gaps left in the catalogues of private companies, to provide examples of the sort of thing the Ministry considers desirable, or to supplement motion-pictures by providing filmstrips or slides of the most important sequences.

The same principle applies to the production of gramophone records. A relatively small number of large private companies of international reputation, edit series of records educational in aim. The Ministerial Commission for teaching methods studies them, decides whether or not to give them the stamp of its approval, and tries to influence future production by its advice. The services of the Ministry of Education also edit tape recordings, such as those for use in teaching modern languages, including French.

In the sphere of cinematographic productions the action of the state is all important. The production of films is an expensive business, and the distribution services of the Ministry of Education provide the largest market open to education films produced in France. As a result, private companies will as a rule not undertake productions without first obtaining approval from the Ministerial Commission, or without obtaining from the state the assurance that they will bear part of the cost in exchange for which the film libraries have the right to lend out the films thus produced to state schools. The producer, in return for the financial share he has undertaken in the film, usually reserves for himself the right to distribute the films in the rest of the non-

commercial field, both in France and abroad. It should be understood that this procedure does not apply to the productions made directly by the production unit of the *Centre Audio-Visuel*, over which the state retains all rights both in cinemas and over television networks. Thanks to this twofold organization about fifty educational films are made each year. To the list of films can be added a few produced independently and at their own risk by private and approved companies, and also a certain number of foreign films. It should also be pointed out that the catalogue of films contains a large number of documentary or cultural films which in the first place were not produced with a narrowly didactic aim, but which, because of their high quality, have been chosen by the Commission.

Since broadcasting both of sound and vision is in France a state monopoly, the production of programmes is carried out by teams from the Ministry of Education to which the *Radio Télévision Française* lends transmitters over the national network for certain hours during which schools of all sorts are open. Thus each week four television programmes are broadcast, two of which are meant for the elementary stage, one for the secondary stage, and one for the technical schools. There are nine radio programmes divided in the following way: six programmes are intended for the first stage (*premier degré*)—one for verse speaking, one as an introduction to music, two for singing, one devoted to the study of sounds and sound pictures, one given up to stories, feature programmes, and plays. Three groups of programmes are devoted almost entirely to the teaching of languages in schools of the second stage, and in technical schools, and for the pupils of the *Centre National d'Enseignement par Correspondence*.

Some of these radio programmes are not meant for group listening in schools but, on the contrary, for single individuals who are receiving their education by correspondence, a type of education reserved for pupils who cannot attend school for some reason, such as ill health.

In addition, a certain number of radio programmes are recorded, either on tape recorders or on records, and are later used in educational institutions. The schools' television service has already made film recordings of certain television programmes, but these films are at present kept exclusively for use in training. In the future it is hoped to broadcast them by means of cinematograph projection.

Use Made of These Aids

The use made of these aids varies considerably at the different levels of education. In all spheres, for every type of aid, the chief users are those engaged in elementary education. There are several reasons for this: the largest number of pupils receive elementary education; more-

over, experience has shown that it is more convenient to use audio-visual aids in a classroom which the pupils do not leave in the course of the day. The equipment is close at hand and need not be moved. Thus it is often found that rural schools, especially those in which there is only one class, make the most judicious and systematic use of audio-visual aids. Elementary education has the further advantage that its time-table and syllabus are more flexible than those at other stages of education. The same person teaches a class for a whole morning or a whole afternoon, and consequently need not keep to a strict time-table, nor need the children change rooms or have a different teacher each period. Mention must also be made of the co-operative attitude of the teachers in these elementary schools; they are in general very favourably disposed towards audio-visual aids. A genuine feeling of humility makes them wish to have the help of aids which they know can render the most valuable services to their teaching.

The use of audio-visual aids is much less widespread in secondary education or in technical education and in advanced work. There are very great differences according to different subjects.

From the beginning, the biological sciences, history, and geography have been privileged subjects. The teachers of the biological sciences use the cinema and television to provide them with a picture of the natural surroundings in which plants and animals live. They appeal to all the resources of the cinema to speed up movement, to observe very swift phenomena, and to explain, by means of supporting diagrams, complex phenomena. But it is filmstrips and slides, especially in colour, which are most widely used. In the teaching of history and geography, slides also occupy a most important place. Cinema and television also play a large part, and by means of these aids for teaching geography it is possible to show such things as the phenomena of evolution in physical geography by moving diagrams, and to show men working and living on the land. Historians can show their pupils a reconstruction, as exact as it is possible to make it, of certain well-known historical scenes, and they can also show them recent events of which a film record has been made. In the teaching of literature, records and sound radio have acquired an important place; the same is true of the teaching of modern languages, and also of music.

A start has been made in other subjects, where the production of aids has generally gone beyond the stage of the prototype.

Development

The last few years have been a period of expansion during which the different aids have become more and more integrated among them-

selves and also have found their place in the general system of education. It is here, indeed, that the most characteristic feature of the development in the use of these aids is to be found. Before the war the different aids were used occasionally by a fairly large number of educationists; it is only recently that the use of these various aids has made a specialized approach to teaching necessary. This development can easily be seen also in the French administrative organization. Before the Second World War there was, for example, in existence a film service and a radio service; nowadays, these means of mass communication which are at the disposal of education have been grouped together and put at the centre of one and the same department.

Since 1944 progress has been uneven. Shortly after the war, equipment was provided as quickly as possible; schools that had been destroyed were reconstructed and all the others were re-equipped. The first great advances in audio-visual equipment were made only ten years ago, but since then development has very much speeded up.

Indeed, on the one hand one sees a greater contribution being made by audio-visual aids which provide information, but these aids are also being asked to perform new tasks which have an intrinsic value in themselves, and are in any case more original.

It may also be said that the somewhat narrow circle of supporters of these aids has been increased by the addition of the majority of teachers and administrators who have given them the stamp of their approval. It is, indeed, not the least surprising feature of this development, that many administrators, heads and inspectors among others, who a few years ago were still very much against audio-visual aids, are now becoming their strongest advocates, often after a spectacular change of front. There again one must be careful not to generalize, for there are still pockets of considerable resistance to the use of audio-visual methods, and development in their use is, as has been pointed out before, very uneven, according to the type of education and subjects in question.

However, what are the reasons for the progress made and for the change in opinion of a large number of teachers, and especially among their leaders? It cannot be denied that campaigns conducted by certain groups of educationists who are strong supporters of audio-visual aids have won over a large number of teachers. In addition, experiments of which the results are irrefutable, carried on in several countries, have made it possible to support these campaigns with plenty of information. Moreover, younger generations of teachers more kindly disposed to progressive ideas than their predecessors have begun to fill many posts.

Another factor has played no less important a part. This is the fact

that in France, as in many countries, there is and has been an acute crisis in the recruitment of teachers. For various economic reasons it has proved difficult to train a sufficient number of teachers. Not only is the effect felt of competition from private industry with its high salaries, but in addition, the increase in the school population and the growing desire for the education of children and adolescents to a greater age is found among an ever-larger section of the people. Thus it proved impossible to meet the needs of a larger number of pupils with an insufficient number of teachers by the usual methods. It cannot be denied that considerable efforts have been made to speed up recruitment, but since resources are not inexhaustible, one of the results has been, especially in primary and secondary schools, that the quality of the average teacher has gone down. Thus, it appeared to many administrators, that it had become necessary to increase the teaching power of the teachers they had at their disposal and eventually to replace teachers by 'cultural machines' wherever it was not possible to provide the continuous presence of a teacher. In this sense, the post-war crisis in the recruitment of teachers has played in the development of audio-visual techniques a part as important as, although different from, that of the Second World War which, from necessity, brought about the advance of these aids. Finally, it appeared that the education of many adults needed to be increased and completed. Now, there could be no question of these adults returning to school or to the university, since they are in employment and fulfil definite functions which only allow them to give up a certain amount of time to completing their education in the evening after work or during their days off. Consequently, there has appeared what has been called *éducation permanente*, an education which it seems necessary to give everyone in their own homes at hours which fit in with the working day.

Under the name of 'tele-lessons' (*télé-enseignement*), that is to say lessons without personal contact, there has appeared a new conception of a more autonomous use of audio-visual aids. Henceforward it is no longer a question of contenting oneself with supplying the teacher with complementary information or with a few pictures, but of bringing directly to the pupils, either singly or in groups, worthwhile instruction. This is true where schools are concerned, but even more in the case of further education. For some subjects the shortage of teachers is so acute that the only way out has been to plan to provide for pupils who are not lucky enough to have a teacher, a course of films, of radio or television programmes. This was generally done reluctantly and with great anxiety until it was observed that the results obtained by the few experiments that were taking place gave rise to a certain

optimism. This twofold instruction is sometimes given to them in schools, but more often outside the schools, either to fairly large groups of individuals, or to a small group, or to single individuals. This new form of teaching is aimed at every level, from correspondence lessons for the elementary stage right up to advanced work. An extremely important part is set aside in the programme under the name of *formation sociale*, permitting adults, provided that they make the necessary effort, to improve by means of diplomas their qualifications and thus their place in the social scale.

In this general progress, audio-visual aids are no longer limited to certain privileged spheres; one can even mention certain subjects but lately considered most unsuited to such treatment, such as mathematics, psychology, and law, for which they are now beginning to be used.

The effect of audio-visual aids is varied. They contribute not only to the acquisition of knowledge by transmitting the word or the picture, but they make it possible to retain this knowledge better by a judicious appeal to the possibilities of dramatization which is only just beginning to be used for educational purposes. The need for repetition in certain spheres, such as modern languages, has revealed that audio-visual aids could easily and effectively replace the teacher in such wearisome tasks, and thus allow him to save time which he can then devote to work more worthy of a teacher.

All the Cassandras began to forecast catastrophies, to declare that by making use of visual aids one would end by depriving education of its individual contacts. Not the least interesting discovery that came to light was that the intelligent introduction of these aids into teaching gave, when used by skilful teachers, a new impetus to what might be termed active methods of teaching.

The integration of various aids is developed further. In support of correspondence courses one finds in close co-operation radio, television, films, tape recorders, slides, and, of course, all types of pictures, charts, graphs, models, and so on. Each of these various aids makes its own contribution to a single aim according to its availability; such aids as live broadcasts or films are supplemented by the aids which make recordings possible, and finally, recourse can be made to the consultation of permanent documents. In such conditions books become more widely used, for they are seen to be indispensable for purposes of reference.

Thus gradually a sort of revision of values is taking place and a revaluation of these aids in the light of a really modern system of education, thought out anew in this machine age. One foresees even in certain cases a new hierarchy in the teaching world. Instruction

is going to be given to students scattered over areas which are sometimes very vast, but this teaching will have to be made complete by that given by assistants who will re-establish, wherever it is lacking, human contact between teacher and pupil. In the sphere of advanced education the professor has perhaps not often time to leave his chair in the university, but his assistants will go to visit, in a certain number of towns, small groups of students; they will complete the instruction by answering questions, directing students' reading, correcting work done. Thanks to this reassessment of the functions of a teacher one can also foresee the coming of a new category of educator. Some of them, of excellent quality, endowed with great teaching gifts, will receive salaries which will compare favourably with those earned by executives in private industry. How could it be otherwise, if one asks educators to address, not a group of a few dozen pupils but hundreds of thousands, or even millions of students at the same time?

Audio-visual aids, in the course of their rapid development, have already assumed in France, as elsewhere, a much more important role than was forecast for them by the most enlightened prophets a mere ten years ago. They still carry out the function allotted to them at the beginning: to provide information and illustration of all sorts. But the educational role reserved for methods of mass communication has already extended far beyond these modest aims. A new national radio network is being planned in France, a network which will be exclusively devoted to educational purposes. A new television network will later be supplemented by all the resources which films and other audio-visual techniques can bring to the support of education. This will be for France a most important step forward in the development of audio-visual aids and their contribution to teaching methods, a most important development; and it would be imprudent for even the most optimistic of the specialists in these techniques to try to define the limits which these developments will reach.

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The History and Theory of Mass Media in Germany

THE use of audio-visual aids to teaching in German-speaking regions has been established for a long time. Early educators like Comenius and Basedow pointed out their importance; in the nineteenth century, when schools emphasized the development of the intellect, their use was necessarily restricted; the reform movement in education in the decade after the First World War, however, took full account of their importance and audio-visual aids were widely developed. The principle of activity methods became generally accepted. This implied increased activity by the pupils in the acquisition of knowledge. No longer were they to gain their knowledge from old-fashioned textbooks and from the words of the teacher, but, as far as possible, were to find out the facts for themselves. In foreign languages, tables of endings were no longer learnt by heart but worked out by members of the class on the blackboard with the help of coloured chalks. In history lessons the main events were illustrated by sketches and drawings, and the pupils themselves made vertical and horizontal cross-sections to show up the lines of historical development. In the sciences, instruction was based on experiments made by the pupils.

The associations of specialist teachers continually examined the educational value of the new aids to instruction and introduced them into the classroom. The Centre for Education and Instruction (*Zentral-Institut für Erziehung und Unterricht*), founded in Berlin, organized courses on the development and application of modern aids to instruction. Progress on these lines was handicapped or even stopped by the interference of the national socialist regime; the so-called 'leadership principle' conflicted with the individual activity of the pupils and endangered the trend in education towards independent thinking that had held sway till 1933. The destruction caused by the Second World War made it impossible to develop the work of the 'twenties in the slow process of reconstruction. The influences of this period were only gradually removed; official directives emanating during the years up to 1950, however, picked up the threads of educational progress achieved up to 1933, and based work in the schools once again on the principle of activity methods. This brought back the use of audio-visual aids, which has steadily expanded since.

This was clearly shown at a conference of inspectors of schools, organized in Germany by the countries of the Western European Union in October 1957. On this occasion modern instructional material was shown in numerous demonstration lessons, and in the subsequent discussions, questions of principle were clarified. There was a far-reaching consensus of opinion that "efficient instruction in all types of schools is possible only with the help of the audio-visual aids brought up to date by modern educational views, since only thus can impressions be communicated that are more effective than the spoken word alone". The role and personality of the teacher remain, however, as before, decisive factors in educational success; the systematic introduction (especially to young teachers) of techniques in the correct use of the material was therefore regarded by the conference as an essential prerequisite of any progress.

It further seems axiomatic that audio-visual aids are more efficient if they are not added to the lesson as an afterthought, but are fully integrated; the preparation and use made of them in discussion afterwards was considered an indispensable part of the presentation. If these principles are observed, there is no basis for the objection that the teacher is by-passed or that the lesson becomes a sort of game.

It was regarded as essential that the different countries should exchange not only comments on their experience, but also the audio-visual aids produced. They expressed the hope that mutual exchanges would be facilitated by abolishing restrictive customs regulations. This principle is specially noteworthy in the case of foreign languages, where closer co-operation between nations is not only possible but also highly desirable. Thus, as the conference has shown, the discussion about an important aid to instruction becomes at the same time a valuable link in the system of international relations.¹

Blackboard—Pictures—Maps—Charts

The blackboard is the principal and still indispensable aid to visual impressions. By comparison with conditions when only a single small surface was available, a number of improvements can be noted. In modern schools the blackboard occupies, as a rule, two sides of the classroom; thus about six pupils can use it simultaneously and the subject-matter of the lesson can be developed on it from several angles. The use of coloured chalks permits important differences to be stressed, and the result makes a clear visual impression. A special kind of board represents an important technical advance. It has a slightly curved

¹ cf. Adolf Bohlen, "Audio-visuelle Hilfsmittel für den neusprachlichen Unterricht", in *Die Neueren Sprachen* (1958), pp. 117 ff.

magnetic metal surface with a transparent plastic cover. On it one can write or draw in white or coloured chalk. Magnets placed on it can mark points in a network of lines (e.g. sine lines in a mathematics lesson) and symbols and models provided with magnets stick to the board; facts and relationships (e.g. in the history lesson) can thus be impressed on the pupils in a manner easily understood. It is also possible to slip printed patterns under the transparent cover (e.g. for geographical contours), in order to enter on them the most important details true to scale. Thus impressive live aids to instruction are developed either before the eyes of the pupils or by them. As the board can also be used horizontally a bird's-eye picture of, for example, a village or a landscape can be developed with the help of magnets and models. Modern improvements to wall boards offer great possibilities.² The model becomes a plastic symbol of reality and mere static apprehension is replaced by the principle of dynamic development.³

Illustrative pictures have for a long time been an essential part of school collections. The culture, way of life, dress, and dwellings of a people or of an epoch can thus be better illustrated than by the words of the teacher; in natural science, charts to explain certain phenomena (e.g. minerals, fungi) are indispensable and generally used. World history comes to life when important details are shown in pictures. From history teaching topics, such as a funeral in the Hallstatt period, a knightly tournament, the declaration of independence of the U.S.A., or the execution of Louis XIV can be illustrated.⁴ Friezes illustrating the history of civilization, such as the development of clothing in the course of history, contribute considerably to the development of an historical sense. To achieve a correct lining up of the individual pictures, a 'chronological line' is frequently used; this seems to have succeeded best in a teaching frieze on French history, where the whole development is divided into a number of equally long sections on which the notable personalities and events of the period are illustrated in pictures. They are particularly suitable for subject rooms, e.g. for English and French lessons, such as were available in Germany before 1933 (*English Study, Cabinet Français*), and which were a great help in modern language teaching.⁵ Pictures of landscapes, important buildings, etc., from the pupil's own country and from abroad are an indis-

² *Westermanns Arbeitstafel* (Georg Westermann Verlag, Braunschweig).

³ cf. *Herders Lexikon der Pädagogik* (Freiburg, 1954), Vol. III, pp. 261 f.

⁴ *Lehrmittelverlag P. Stockmann*, Bochum (105 by 70 cm, on canvas, with rods).

⁵ cf. Adolf Bohlen, *Neusprachliche Methodik*, 3rd ed. (Heidelberg, 1958), pp.

pensable part of the equipment of any classroom; they can be exchanged from time to time and are often available free of charge from the travel agencies of the various countries.

Geographical maps have also reached a high standard of development. In its traditional form, the physical or political map is universally known. Modern teaching methods supplement it by applying the dynamic principle mentioned above. The final cartographic picture keeps its importance; but by building it up from basic geographic knowledge, the teacher endeavours to make the pupil acquire information actively. At the same time the economic importance of certain districts is considered in greater detail. An historical theme, like the development of the right to vote, so important for modern democracy, can be illustrated graphically, as can the utilization of raw materials in world economy—topics which have to be treated in school, and also in adult education, since world events are largely shaped by them. English firms have produced model aids to teaching on such topics as 'Cotton', 'Coal', 'Oil'. In the nature of things some aspects of these topics become obsolete after a few years and have to be brought up to date by new surveys. As it is not possible to replace the whole of the cartographic material each time, it is advisable to complete it by using outline stencils (such as Westermann), provided in great numbers by publishers for nearly every country. The pupils can enter all the factors known to them and develop for themselves the geographic and economic picture of the earth. So-called 'speaking maps' used to be made where pictures of the fauna and local produce were entered on maps of, for example, Australia or New Zealand. As it was impossible to do this to scale, teachers were afraid there might be a confusion of concepts. The total picture has therefore been divided into parts to avoid crowding with details.

The same method was used by the author to introduce the study of national cultures,⁶ that is by resolving them into their various components. For example, by a combination of maps and pictures the main aspects of China are presented (1) as vast and populous country (distribution of the rural and urban population compared to Germany); (2) as a fertile country with rich natural resources (occurrence of coal, iron, copper, and kaolin as well as cultivation of soya beans, tea, and silkworms); (3) as a country with blessings and curses (catchment areas of the two main rivers, with the large volume of water carried and the shifts in the position of the river-beds in the course of the centuries); (4) as a country with the city of gateways,

⁶ Adolf Bohlen, *Moderner Humanismus* (Heidelberg, 1957), p. 140 ff.)

temples, and pagodas (Peking with the old imperial and Chinese City); (5) as a country across Central Asia (the age-old trade routes for tea and silk); (6) as a realm of 1,000 islands (neighbouring Japan, with special maps, 'peoples and religions').⁷ The accompanying explanatory text adds historical, geographical, and ethnographic details to every picture and suggests group and silent work. This combination, incidentally, demonstrates the close relations existing between the principles of activity methods and modern visual aids. The one is inconceivable without the other.

Diascope—Epidiascope—Filmstrips

The pictures and maps already discussed are part of the basic equipment of any school. Financial if no other considerations limit, however, the quantity that can be purchased. On the other hand, teachers wish to supplement them by visual material of their own choice. The culture of any people and country, as well as of any historic epoch, is so many-sided that this wish seems justified. Attempts have therefore been made over a long period to utilize for classroom teaching suitable illustrations brought back from abroad or found in literature. Teachers who valued the visual approach therefore themselves undertook the laborious task of transferring such pictures to glass diapositives or, more simply, projecting them direct by means of the epidiascope. In the meantime the production of pictures destined for projection has made such progress that an almost unlimited selection is available. The basic work was done in Germany by the Centre for Education and Instruction (*Zentralinstitut für Erziehung und Unterricht*), especially in the years following the Prussian school reform (1925). In 1934 it was converted into the State Institute for Film and Picture (*Reichsanstalt für Film und Bild*), and after the Second World War it was replaced by two institutions in Hamburg and Munich, which were united in 1950 in the Institute for Film and Picture in Knowledge and Instruction (*Institut für Film und Bild in Wissenschaft und Unterricht*), located in Munich. This institution is financed by contributions from the member states of the Federal Republic (1958: D.M. 1,155,200), which are assessed at 12.95 Pfennig per pupil, while industrial and economic bodies contribute a further D.M. 400,000.

The task of this institution is in the first place to plan and produce films, filmstrips, and sound tracks. It has two teams of photographers at its disposal who can produce only a fraction of the material themselves.

⁷ Westermann-Schautafeln, Verlag G. Westermann, Braunschweig, 26 sets so far, about European and non-European countries.

The greater part of the work is delegated to independent producers; the standard is therefore not uniform and does not always correspond to the requirements of the teachers. Since the beginning of the work a total of 173,453 filmstrips with 2,653,470 separate pictures has been made available. Of the seventy-five filmstrips produced in 1957-8, forty were destined for schools with general courses, especially for use in the following subjects: German, art, history, geography, astronomy, biology, social studies, and physics; thirty-five filmstrips were devoted to the interests of trade and vocational schools (pictures of different crafts, agriculture, and so on). They also assist the work of the youth organizations and of adult education (people's high schools—*Volkshochschulen*). The institute not only produces filmstrips and supervises the production of visual aids by private firms, but it also publishes accompanying texts which contain, besides information for the teacher, hints on methods of using the material, advice on suitable times for using it, ways of working with it and follow-up, as well as a short bibliography. A committee examines new apparatus and passes it as suitable for schools if it conforms with the standards laid down.

The film products are distributed by fourteen regional centres (*Landesbildstellen*) in the member states of the Federal Republic; North Rhine-Westphalia, Bavaria, and Baden-Württemberg have two each. These are in charge of the work of 252 urban and district centres. As there is no central Ministry of Education for the Federal Republic, the organization and legal standing of the centres vary very much. They advise schools and other institutions on the purchase of the necessary apparatus, lend filmstrips, and so on, and maintain departments to deal with the servicing and repairing of equipment. The extent of the work is shown in the following figures; e.g. the centre for Westphalia lent the following strips in 1957: 95,740 to schools, 4,371 to youth organizations, 7,194 to adult education centres. Filmstrips are lent free to schools; in other cases a small charge is made. To give some idea of the work done in this field it should be noted that the Hamburg centre lent out 16,679 strips in 1957 and 19,886 in 1958, and the Berlin centre, which has a collection of roughly 75,000 original negatives, lends on an average 800 pictures a day.

The educational significance of the still picture is demonstrated by the extent of its use. Like all visual aids, it must be simple, impressive, and valuable for education, and the illustrations depicted must form in the imagination an integrated picture which impresses itself on the memory. The still picture allows one impression to stay without being wiped out by another. The producers are therefore endeavouring to develop this visual aid further. The diapositive must be technically

clear without confusing detail; it must deal with a truly representative theme, fully exploit it and avoid all superfluous padding.⁸

For the teaching of modern languages filmstrips produced by foreign firms are mainly used in Germany; they show in about thirty pictures important cultural monuments, landscapes, and personalities. They are accompanied by pamphlets which give the necessary explanations in the foreign language or summarize the essential point of the picture in a sentence or a question.⁹ As only a limited number of pictures can be discussed and fully worked through in one lesson, selection is necessary so that the pupils can study the picture in greater detail, take notes and collect material for subsequent discussion in class. In the teaching of French, the filmstrips produced are lent by the *Ambassade de France* and have done good service. There is thus no lack of suitable material.

Instructional Films

The question is often mooted whether the still picture is not out-dated by the moving picture. Educators emphasize that the still picture has the advantage that the period of impact producing valuable visual impressions can be controlled in accordance with the receptiveness of the class. The still picture also trains young people in the art of observation, and thus prepares them to have not merely a receptive but also an active attitude towards the real film.

For depicting strange landscapes or presenting artistic impressions, i.e. in geography and art, the still picture has undeniable advantages and cannot be replaced by the film. The film is called for where movement, the course of a certain process or work done is to be shown; but here, too, the instructional film must allow us to stop at an individual picture, to reverse, and to repeat a series of pictures in order to allow a detailed study of the material shown. There are, of course, transitional forms between an instructional film and a feature film, according to the topics, and the uninterrupted showing of such films can be valuable both in school and for further education. It is a moot point how far the instructional use of film can be a preparation for the feature film. The extreme view is occasionally heard that the book and the school have long been out-dated by the film. That is certainly going too far. Training in critical appreciation of the feature film is a different question. The idea in itself is all right; only some of the films produced by the industry in its present state are valuable, as they are

⁸ Coloured diapositives were produced, amongst others, by Flemmings Verlag (200 filmstrips with more than 2,000 individual pictures, available from Pestalozzi Lehrmittelhandlung, Hamburg 39) and by Verlag Westermann.

⁹ cf. the list in Bohlen, *Methodik*, op. cit., p. 178.

mostly intended for the masses and determined by considerations of financial gain. It is possible to counteract the potential deterioration of taste by education, e.g. in the art lesson; whether a lasting success is likely is dubious in view of other tendencies, which encourage superficiality.

In the first preparatory period the so-called cultural films, limited to a duration of 10–20 minutes, were developed by firms like Ufa and shown regularly before the main film—at first, of course, as silent films with accompanying music. They were also lent out to schools and educational institutions where suitable equipment was available. After the founding of the State Institute (*Reichsanstalt*) in 1934 the development was systematized; the work was independent of the authorities responsible for political propaganda. Definite techniques were developed for their educational use; individual pictures were enlarged and brought nearer to the spectator (close-up), movements were slowed down or speeded up (slow and quick motion), and so on. Examples from this period of the silent film are: fairy tales and animal stories for youngsters, geographical films (life on the Puszta, icebergs in Greenland), biological themes (the development of insects), physical processes (work on raw materials), historical pictures. Only one film was made to illustrate mathematical problems.

After 1945 the third period began, that of the sound film. The introduction to social problems came to the fore, and with it the use of discussion in the film. For technical and financial reasons the majority of films are silent; there are 30,000 school projectors for silent films compared with 3,000 projectors for sound films.

During 1957–8 the Munich Institute produced sixty-one films (thirty silent films, thirty-one sound films, of which six were in colour). Of these, twenty-four were intended for schools providing a general education. These films were, for example, about animals (*Adventure in the Forest*), included topics for natural science (the sea—the primeval forest—the moon), biographies (Kepler, Zola), travel (landscapes from Chile, Austria, Norway, Eritrea, Normandy, some of which were taken over from foreign producers), and international co-operation (*Workshop of Peace—UNO*). Twenty-nine films were intended both for continuation and vocational schools and for adult education; for example, work in the mine and in rolling mills, the exploration of the atmosphere, activities in agriculture and forestry. Foreign topics that might provide a cultural background for modern language lessons have so far been neglected, although they are much in demand by the teachers. There are only very few suitable films, mostly of foreign origin, available for the living languages; *La Famille Martin*, produced in England, is still unique, probably because of the high cost. A film of this type is the

best preparation for visits to commercially produced films in foreign languages, such as the several films of Shakespeare's plays.

While in the films produced before 1945 the emphasis was on facts, after the Second World War more attention was paid to man and his relation to the world around him, and this may be shown by a suitable story. A film intended to illustrate the variety of authorities and bodies which serve the community is an example of carefully thought out dramatization. *Aurach Needs a Mechanized Hose* shows us the efforts (and eventual success) of a village boy to persuade first the local and then the higher authorities to grant the necessary funds. An opportunity was taken to show the work of the municipal authorities and the scope of their responsibilities. In addition to the fact that the course of events is rather incredible, in an endeavour to cover everything, rather too much is attempted. These defects constitute a danger. For schools, greater simplification and a limitation of material is desirable, while for adolescents in continuation schools and for adults other conditions prevail. In the production of films it seems necessary, therefore, to take into consideration their different aims and to produce more specialized instructional films than has been done so far.

For the purposes of schools the running time has also to be taken into account. If an instructional film lasts twenty minutes or more, with some minutes having to be allowed for technical preparation, then a normal lesson does not leave sufficient time for subsequent discussion. Therefore an upper limit of twelve minutes should be adhered to. In country schools this is less important as the time-table can be more elastic. In town schools, however, and in secondary schools with their fixed time-table, the forty-five-minute period customary in Germany usually cannot be exceeded. The use of instructional films in preference to other visual aids will therefore only be justified when the educational result bears a reasonable relation to the time spent.

Records and Tape Recordings

The importance of gramophone records¹⁰ was first recognized by modern language teachers, who based on them a purely aural method. The English phonetician, Daniel Jones, had emphasized, as early as 1909, that correct pronunciation and correct intonation of a foreign language could only be acquired with the help of the gramophone, which at that time was technically primitive. His technique was considerably improved in the First World War by Doegen, who made

¹⁰ This passage is based on an extensive report, "The Gramophone in Modern Language Teaching", with contributions by Wolters, Olbrich and Plaut, ed. by Schümmer, Supplement 20, *Neuere Sprachen* (Frankfurt and Marburg, 1930).

numerous recordings of the speech of foreign people in prisoner of war camps and made possible the *ad lib.* repetition of separate passages and parts of sentences by means of the repeat switch invented by him. After *Phonetic Readings in English*, published by Jones (Heidelberg, 1912), had been supplemented by speech records (collected by Driesen), Klinghardt also published a series of records, partly of single sentences, partly of continuous passages, to accompany his exercises in English intonation (1926). The Linguaphone Company produced sets of records for beginners as well as for cultural lessons in the middle school and for the work of the upper forms. Records were also published in conjunction with some textbooks of English and French (by Diesterweg, and also to go with the English instruction books by Bolle-Bohlen); these recorded separate lessons spoken by foreigners. Supplementaries to the textbooks are still available. This process made apparent the importance of correct beat in speech: choral speaking by the class, usually in conjunction with intonation graphs on the blackboard and corresponding gestures by the pupils, facilitated the memorizing of the correct intonation. The belief that there would be an unconscious transfer to any foreign text, and imitation of this intonation in conversation in class, was probably justified. Some teachers of modern languages went so far as to present the aural method as the only correct one, but they had to admit that it is not applicable at all stages of instruction and does not fulfil the needs of pupils with an inclination towards a more visual apperception. More recently therefore, the systematically built-up textbook has been widely recognized as the main basis of instruction and the acoustic aids are regarded as necessary supplementary aids. Unfortunately, there is too little use of records rather than too much. As greater attention is again being paid to phonetic education when the university stage is reached, where students are trained in the use of disc and of tape recordings, it is to be expected that modern teaching will make fuller use of these aids and utilize the experience gained before 1933 more thoroughly than has been done so far.

What has been said about such aids in modern language teaching is true to some degree about other subjects. The collections built up before the war were mostly destroyed; since then production has again reached a considerable level. The most valuable pieces of German literature are available on records; spoken by masters of the language, they enable record libraries to be built up in schools and homes. Thus there are available, for example, individual scenes and complete performances of plays (*Nathan der Weise*, *Iphigenie*, *Faust*, *Wallenstein*, *Jedermann*), as well as famous monologues (*Hamlet*), poems from various periods (e.g. lyrical poems by Goethe, Schiller, Eichendorff,

down to Gottfried Benn), masterpieces of German prose and readings by authors (Thomas Mann, Dürrenmatt). Illustrated pamphlets giving the text and introductions to the work and period ease the approach to the great creative masterpieces.¹¹

The regional centres (*Landesbildstellen*) have considerable collections of records available for loan; thus the Hamburg centre made available in the last two years some 6,000–7,000 records per year. The Munich centre produced twelve records with works by Mozart, Weber, Wagner, Bach, and Handel. It is well known that there is nothing yet that can beat the gramophone recording of musical performances, and continuous technical improvements assure faultless rendering. A new venture is represented by the series 'Illustrated Musicology' produced by the German *Gramophon Gesellschaft*. Based on educational considerations, it comprises selected passages from the music of the Middle Ages, Renaissance, Baroque, and so on down to jazz and decaphonic music; the excerpts are separated by clearly visible dividing grooves and commented upon in accompanying booklets. The introduction of a technical device makes it possible to find specific passages again, such as the main or subsidiary motif, the reversal, and so on. Musical training is thus considerably facilitated.

The number of tape recordings is already more than three times that of gramophone records, as the tape offers certain advantages. The archives of the Berlin centre comprise at the moment 1,300 titles with 1,950 tapes, and the lending section has available 630 titles with 5,300 copies. A report issued by this centre¹² in 1954 of experience gained in the use of tapes in Berlin schools, reviews five years' work and shows that this new aid has proved educationally successful. It is used in most subjects: for German, history, geography, and science more or less to the same extent in all schools, for music and modern languages mainly in continuation schools, while in social studies tape recordings are mainly used in professional courses.

The advantage of this teaching aid (and, of course, also of the gramophone record) is that it trains students in intelligent, concentrated, and creative hearing and listening, i.e. in an attitude that is important in every form of education and that is especially endangered in our time by the flood of visual impressions. Ample use is made of the possibility of interrupting the recording, of repeating it, and of listening to parts of it. The interest of the pupils is heightened by the rendering of noises typical of certain geographic regions (e.g. animal voices, Negro drums)

¹¹ *World-Literature on Gramophone Records*, ed. by the German Gramophone Company (Hamburg 13).

¹² Landesbildstelle Berlin (Berlin N.W.87, Levetzowstr., 1/2).

and of acoustic historic documentation (e.g. speeches, documents of the times). A pre-requisite for educational success is the complete mastery by the teacher of the technicalities of handling the equipment and in his ability to accustom the class to the novel procedure. A warning is needed against too long performances; five to ten minutes should be the rule, except in the case of a fairy tale or animal story in the younger forms; such limitations do not apply for special purposes outside the lesson, such as preparation for an amateur performance by listening to model scenes. The tape-recording catalogue of the Berlin centre shows that all subjects of the curriculum are represented. Tape recordings are also available for the modern language textbooks used (seventy-eight in English, nineteen in French, two in Spanish); new editions necessitate changes—unfortunate but unavoidable—but this drawback is shared with gramophone records produced for the same purpose. There are in addition tape recordings intended for use in the further training of teachers.

In the development of the aural aids to teaching, competition between gramophone records and tape recordings is still apparent. The sound of the needle, although now much diminished, is still felt to be an intrusion, and the electro-magnetic process used with tape is regarded as technically superior. It has undisputed advantages, especially in foreign language teaching, when the pupils record parts of a passage read on tape and recognize their faults when they listen to it. Comparisons are very useful. We have to resign ourselves to the fact that mechanical reproduction without bone resonance at first seems strange to them.¹³ In the U.S.A. this procedure has been developed on a large scale in the speech laboratories of schools and universities; in Europe it will only be possible to introduce it in exceptional cases owing to its high cost.

Radio and Television

In the early years of broadcasting, soon after the First World War, any educational use of this medium was out of the question. The German broadcasting corporations were founded between 1923 and 1924; however, the North German Radio (*Norag*) began to transmit English and music lessons for schools as early as June 1924; its example was soon followed by British broadcasting. The first training course of the Berlin Centre for Education and Instruction (*Zentralinstitut für Erziehung und Unterricht*) on the topic "Broadcasting and the Schools" took place as early as October 1924. A School Broadcasting Association

¹³ cf. Hartmut Vogt, *Daß Tonband im Fremdsprachenunterricht* (No. 12 in the series of the Deutsches Zentralinstitut für Lehrmittel, Berlin, 1957).

for the whole of Germany was founded and, in conjunction with the Prussian school reform, lively educational activities were started also in this sphere, too. The new building of the *Kaiser-Wilhelm Realgymnasium*, in Berlin-Neukölln, finished in 1928, was one of the first educational institutions with a central radio receiver, with which all classrooms were connected. The daily Press devoted articles of considerable length to the new installation and to lessons given with the help of broadcasts. The economic crisis of 1930 slowed down this progress, and the National-Socialist Teachers' Association, as well as the Hitler Youth, diverted school broadcasting to serve their own purposes, until, in the Second World War, it died out "even in this adulterated form".¹⁴ In the period of reconstruction a number of new broadcasting corporations was founded and developed school broadcasting departments, e.g. *Norddeutscher Rundfunk* (Hamburg), *Westdeutscher Rundfunk* (Köln), *Süddeutscher Rundfunk* (Stuttgart), *Südwestfunk* (Baden-Baden, with a school broadcasting department in Freiburg), *Bayerischer Rundfunk* (München), *Sender Freies Berlin* and *Rias* (Berlin). The multiplicity of these institutions is matched by the number of relevant publications; judging by them, "school broadcasting would be quantitatively the most important concern of all the radio programmes discussed in literature".¹⁵

It is difficult to give a comprehensive picture of school broadcasting in Germany. The mere enumeration of the broadcasts sent out by the various corporations in the course of one year would fill many pages. A few characteristic examples will serve to illustrate the type of topics with which school broadcasts deal. According to a report of the *Westdeutscher Rundfunk*, the following broadcasts are addressed mainly to primary schools: playlets, describing events in town and countryside; reports about regions and people in the vicinity; broadcasts which aim to encourage responsible co-operation in the home, the school, and in public; sagas and legends in the form of plays. More ambitious themes are intended for the continuation classes and schools (including the secondary schools): the past brought to life (historical plays, selecting only events which are still having their influence on our time)—prose and poetry readings—reports of explorers and travellers—regional pictures and plays dealing with the works of inventors and musicians—broadcasts in civics.

The last-mentioned group is gaining increasing importance, as are

¹⁴ Paul Gerhardt, *Der Schulfunk, Pädagogische Arbeitsblätter zur Fortbildung für Lehrer und Erzieher* (September, 1957, Süddeutscher Rundfunk, Stuttgart), p. 241 ff.

¹⁵ Heribert Heinrichs, *Der Schulfunk* (Dissertation der Universität Köln, Verlag der Pädagogischen Akademie Aachen, 1956), discussed by P. Gerhardt, loc. cit.

instructional films. The Berlin school authorities, in co-operation with the Visual Aids Centre (*Landesbildstelle*) and the school broadcasting departments have therefore planned an experimental series of twenty model themes on political education which are to be listened to and utilized in the ninth school year in the different schools. Altogether 2,306 classes took part in the experiment, and reported on their experiences. The chosen topics were judged as follows: 53 per cent of the teachers regarded them as necessary, 44 per cent as acceptable or desirable, and 3 per cent as superfluous. Broadcasts that could be used as source material for history teaching were described as particularly good, especially in the form of plays; but the danger that "dramatization at any price" might lead to a debasement into pure entertainment was not disregarded. Interviews with politicians, occasionally with subsequent discussion, caused grave critical doubts. Situations which presented excerpts from real life were appreciated; they should be typical situations and illustrate concrete, easily intelligible, elementary facts, starting from one characteristic case. The instructional and educational value was regarded by 80 per cent as positive, by 11 per cent as sufficient (with reservations), and by 9 per cent as negative. From this the possibilities and limitations of school broadcasting for political education can be deduced; broadcasting is especially valuable when it leads to worthwhile class discussion, in which the problem set is really clarified. As a pre-requisite, the report emphasizes that every broadcast must be planned as an integral part of the teaching and adequately prepared. Unfortunately in only a small number of cases (682 classes) were the broadcasts listened to in connexion with the curriculum, in 1,492 classes they came outside the syllabus. This isolation of the broadcast lesson was also shown in the lack of preparation: 270 teachers had prepared the broadcast, 1,201 had not. Owing to this, the frequency of participation declined—of the classes that took part in the first broadcast only a minority participated in the twentieth broadcast. The Berlin report comments that the close integration between syllabus and broadcast is not always feasible because of the amount of material involved. A further reason is the demand to adapt the topics selected to the educational programme of the different school years. Thus the earlier experience is confirmed that a school broadcast programme is the more effective the more closely it is adapted to the specialized demands of the different subjects, types of schools, and age groups.

This demand is fulfilled to a considerable degree in the broadcasts for modern language teaching, where it is most imperative. For it makes a difference whether one is working with pupils who are merely being introduced to the elementary stages of the foreign language, or with

pupils who aim already at a fair ability to speak, or with the older pupils in the top forms of secondary schools, for whom the syllabus envisages a study of the spirit of the foreign culture. The effect of these distinctions on the programme of the broadcasts is shown by the very well-worked-out programme pamphlets of the broadcasting corporations. In the series *English for Juniors* of the *Westdeutscher Rundfunk* for summer 1959 we find, for example, a number of passages intended for the second and third year of teaching English (there is no such help for the first year) which contain simple English in everyday language. These broadcasts are spoken slowly (and, like all modern language lessons, by foreigners) as far as this is compatible with genuine intonation; they bring playlets about everyday life in England, verses and songs for children. For the fourth year the themes are somewhat more ambitious and the speed of delivery is increased. The pupils in the middle school receive in English II from the *Norddeutscher Rundfunk*, besides pictures of everyday life in England, impressions from the U.S.A., of an average length of three pages of text; this course is accompanied by English and American folk songs for which an easy piano setting is printed (which is important for preparation and revision). The broadcasts specially suited for upper forms of grammar schools are called *English for Seniors* by the *Westdeutscher Rundfunk*; they deal, amongst other things, with Ireland, typical English scenes (Hyde Park Corner, etc.), short stories by various modern authors, as well as scenes from Shakespeare; American themes are represented amongst others by Jefferson and Franklin. French teaching is at the moment somewhat in the background in the Federal Republic because of the competition of Latin; it is specially catered for by a series, *Parlons français*, mainly intended for third and fourth years. The Bavarian radio, which has been sending broadcasts for the English lesson for a long time, also plans a French series from September 1959, if secondary schools agree that there is a demand for it.

This extensive and educationally well-planned programme, illustrated by pamphlets, is unfortunately not matched by sufficiently wide use in the schools. During the preparations for a special conference about school broadcasting it appeared that out of more than two hundred secondary schools, twenty-four listened more or less regularly and eleven occasionally to modern language broadcasts. While the broadcasts for the lower forms were favourably commented upon throughout, it was pointed out that the main difficulty and obstacle, in the way of a more general use of broadcasts in the higher forms, was the fact that the material broadcast was frequently too difficult, or needed longer preparation, for which the time was lacking. Pressure

of time, from which the German secondary school suffers, prevents the fuller use of modern audio-visual aids, and especially of broadcasting, which educators urgently desire; this could only be remedied by a freer syllabus for the upper forms and greater freedom to select amongst the subjects, a relaxation that has only been permitted by the authorities in exceptional cases. The objection which used to be made, that the times of the broadcasts did not fit in with the school time-table, does not apply any more. After initial resistance, the broadcasting corporations have agreed, while safeguarding certain copyright regulations, to the tape recording of at least some of the broadcasts by interested teachers, who can then insert them at suitable times in the lessons.

Even after removing this difficulty, much remains to be done before broadcasts become a regular part of normal lessons. The production is sound, and the broadcasts are improving steadily with the co-operation of educational advisers. The broadcasting corporations readily accept the criticism of the teachers; the *Süddeutscher Rundfunk*, for instance sends all the schools in its districts questionnaires for voluntary comment; the same station regularly sends an editor, a so-called 'traveller in broadcasts' to visit the schools; she listens to the broadcasts with the pupils and reports on her observations. The Berlin Centre (*Landesbildstelle*) runs training courses for teachers in the use of broadcasts. The *Westdeutscher Rundfunk* co-operates with the seminars in which young teachers receive practical training. Often, however, the means to purchase suitable apparatus is lacking. The *Norddeutscher Rundfunk* therefore lends out receivers or grants loans for their purchase. If broadcasting is, however, to serve education on a wider scale, it is necessary to demand considerable financial help from the Ministries of Education and the municipal education authorities.

With regard to television, caution is recommended. Most of the programmes are not suitable for young people and do not receive very favourable criticism from competent judges. Sound radio faces the problem sceptically;¹⁶ school television would have to investigate the possibility of finding a place by the side of the existing audio-visual aids and take up themes which school broadcasting or educational films could not deal with at all or not so well. The small size of the picture and the need to keep to fixed times of viewing render a discussion of television in education premature. An insignificant number of schools (with the exception of boarding schools) possess television in Germany. Television programmes intended for schools are so far

¹⁶ cf. the report on a conference of the *Evangelische Akademie für Rundfunk und Fernsehen* in the programme pamphlet of the *Süddeutscher Rundfunk* (January, 1959).

out of the question because of the high cost involved. To what extent television can contribute to help the child understand the world is a question which needs careful study. For the moment it seems more appropriate to make more general use of the rich stores of educationally tested audio-visual aids and thus to lead the way from the book, which will always keep its place as a source of knowledge, to a lively apperception of the world of to-day.

ADOLF BOHLEN.

Experiments in the Use of Mass Media in Italy

THE most remarkable feature of mass media of communication is undoubtedly the 'widened horizon' which they afford, transcending the age-old barriers of restricting circumstances. Barriers exist nationally, or at the provincial or strictly local level; yet the new media permit the widest possible interaction of practices, habits, attitudes, and philosophies of life. It has been rightly said of the cinema, historically the first of these new media, that it established a universal language intelligible to all men, whatever their race or country. It is the expression of speed, and of the simultaneous involvement of all. It would be difficult to assess how far films have contributed to the establishment of really sound international understanding and sympathy during the first half of the present century. They have brought people close together and shared among them common modes and idioms of life.

Thus, by definition, mass media of communication afford means of education quite apart from any organized provision in schools; and this characteristic underlines and accentuates the whole nature of mankind, as well as the fluidity of the very culture which mass media transmit. In this way any discussion of mass communication must inevitably consider them in the context of their educational and cultural influence. We, on the contrary, have a duty to see how they have managed to establish themselves in school, by taking on a more precise teaching role, assisting in the work and helping it to keep up with the times.

Italy is not completely without experiments of this kind; but they are restricted by the limits imposed by our economic conditions. Moreover, especially at the beginning, they were hampered by an understandable mistrust occasioned by their 'entertaining' character. There is indeed a prevalent and less understandable scorn for anything that is 'easy' in itself, or calculated to make other things easy, and is therefore a reflection of popular preference; this scorn is reflected in the austere notion of school and study which is traditional and still general. We have the example of school films. As early as 1924 the *Istituto Luce* was founded in Italy with the intention of developing the cinema in the field of adult education, as a vehicle for civic and social instruction. It was an institute under the joint administration of several ministries, with responsibility for producing documentary films and

short instructional films on such topics as health, social welfare, and farming. It was endowed with generous financial help and efficient technical equipment. Furthermore, in that year a letter from the Minister of Public Instruction drew the attention of heads of institutions to the teaching function of film. However, the spread of film methods to schools has been rather slow; on the whole it cannot be said that we are really entitled to speak of "school films in Italy". The cost of the cameras and other plant has made this impossible, and still does.

Financial Background

The budget of the Ministry of Public Instruction in Italy is considerable when compared with that of other ministries. It is second only to the budget of the Ministry of Defence, without taking account of the fact that if the sums earmarked for instructional or more widely educative purposes in the budgets of other ministries (e.g. the Ministry of Labour, or the Ministry of Home Affairs, or of Agriculture, or the Ministry of Defence itself) were reckoned, we should find the educational budget a long way ahead of any other; and there would still remain the 12 per cent of the total national expenditure set aside for public instruction. However, the greater part of all these funds assigned to public instruction is intended to pay for the very modest salaries of the teaching staff. During the financial year 1957-8 the complete sum set aside for *scuole medie* (junior secondary schools), *licei-ginnasi* (senior classical secondary schools), *licei scientifici* (senior modern secondary schools), and *istituti magistrali* (teacher training schools), which together comprise the most notable part of secondary education in Italy, amounted to 35,000,000,000 lire. However, 99.65 per cent of this amount was allocated to salaries, while not more than 0.35 per cent remained for 'services'; that means about 100,000 lire a year for each school, to be spent on providing science laboratories, libraries, materials for the history of art, maps, and so forth. Similarly, out of the 19,500,000,000 lire provided for the universities during the same financial year, barely 5 per cent was appropriated to 'services'. Naturally, every secondary school, like every university, places additional reliance on other support and, one hopes, on its private resources: bequests, donations, school fees, and so forth. It still remains true, however, that every school is bound to provide primarily for its immediate needs in scholastic equipment rather than the 'luxury' of a film projector.

Films in Schools

The idea that school films should be an instrument in the hands of the teacher, to be used by him in the course of a lesson like any other

teaching aid, has introduced the question of films in relation to other equipment, either in every classroom or at any rate as shared by a number of classes. A single projection room or a single apparatus, for that matter, in a school of more than 1,000 children, with thirty or forty classes, would be worthless; indeed, it would rather introduce a cause of confusion. Educational films could only make sense where they followed the development of a course of study and, so to speak, formed an integral part of the organization of the lesson (even though in a progressively organized school it may not be possible to speak of a regular lesson in the traditional sense of the word). If this is out of the question, why spend money on an educational aid that can be of so little use?

At the present moment the question of school films has been further complicated by the lack of suitable titles. The absence of a 'public' has given no inducement to producers to invest money in educational films. Thus schools which might get themselves equipped or which, by good fortune, are already equipped for this visual aid are unable to make practical use of it because of the dearth of suitable material.

Some years before the Second World War the Minister of Public Instruction initiated the foundation of a school film library within his organization. Its purpose was to make available school film equipment and promote the production of suitable themes, following the example set by the Rural Broadcasting Organization, which for several years had successfully taken this responsibility upon itself in connexion with school broadcasts. But this school film library, which has recently been inflated into the National Centre for Audio-visual Aids, thus claiming an option, so to speak, on school radio and school television too, though it actually continues to devote itself almost exclusively to school films, has very few results to show. Subsidiary offices have been established in the various local directorates of education (Provincial Centres for Educational Film). Attempts have been made to encourage schools to buy equipment on deferred payments. A supply of films for hire has been made available. There is certainly nothing to compare with the British Educational Foundation for Visual Aids and its six-volume catalogue. The most recent catalogue published by the National Centre for Audio-Visual Aids in Italy (that of 1957) lists approximately 250 films. The overwhelming majority of these deal with surgery and similar technical processes; as such, they cannot possibly be used in elementary or secondary schools. Neither are those about surgery suitable for use in universities, nor those on technical processes suitable for vocational schools.

To sum up, in the present state of Italian education, Ministerial pronouncements seem still to fall short of reality. Evidence offered in connexion with the "ten year plan for education" (now under discussion in Parliament and intended to bestow on Italian schools a sum of more than 1,000,000,000,000 lire within the next ten years, over and above the ordinary allocations in the budget) reveals that we are short of 80,000 elementary school classrooms and more than 40,000 classrooms in other schools. Consequently, classes must be held in two or three shifts. In this state of affairs, when the sums allocated for educational equipment are well-nigh laughable, school film is a sort of distant mirage that chills the eagerness even of the most enthusiastic. Moreover, as stated above, this state of affairs is aggravated by mistrust of an instructional medium that appears to be an instrument of escape and amusement rather than of study. We have to reckon with a deeply rooted, indeed fundamental, prejudice in favour of other media which are more serious and better prepared. One contributing factor to this feeling is the evident fact that young people know more on the subject of the cinema than the teachers themselves. The latter are driven farther into distrust rather than relieved of it by this very fact. We cannot deny an underlying fear, constantly revealing itself and supported by impatient educational theory, that film lessons can and are intended to "take the place of the teacher", making his work ineffective.

On top of the meagre development of educational film there is the additional embarrassment that clear ideas about what it can and ought to do are not readily come by. There is a grand debate going on, ostensibly to distinguish 'instructional' film from 'cultural' film, 'documentaries' from 'technical' films, and so on. Consequently, 'instructional' film has come to be imagined as a lifeless sequence of shots lacking any particular structure. Such might be the Petrarch manuscript in the Vatican library, or a comparable illustration of an experiment in physics, or just any successor to any old educational textbook. This concept is encouraged by the fear that the cinema may supersede the teacher, and by the consequential wish to keep film firmly under the control of the teacher himself so that he can use it like any other teaching instrument in his armoury. It is also encouraged by the fear of the entertainment which film offers, so that it appears necessary to eliminate entirely its interest and narrative characteristics, its constructive unity, or in other words its dramatic nature. As a result, the film is sterilized. It does not invite anyone to face the financial risks involved in equipping a school or in producing films. • • •

The Purpose of an Educational Film

I have no doubt that an educational film, like any other, must primarily insist upon its special character, and thus be able to arouse the interest of children. It must stimulate them, because in this way only can it really widen their horizons and extend their thought. Rather than settle for a precise instructional task (though of course there may be films of this sort), school cinema should seek ways of enlarging experience of the world and of things. It is only on this foundation that the teacher can base his work. The child who 'has seen', who has been 'moved', is much more ready and willing to pay attention and remember. In this sense, therefore, the distinction between 'instructional', 'cultural', 'documentary', and 'scientific' film (and any other of the innumerable distinctions) becomes more unsubstantial than ever. The important thing is that the presence of this means of mass communication has the power to strengthen the school and bring life to the teaching.

In saying so we do not fail to recognize that film can sometimes lose all its special qualities as a spectacle, by taking on a clearly scientific purpose and value, in elementary and secondary schools as it usually does at the university level of instruction. On the whole, however, this should not happen. If it did, the best that the film can offer would be lost to the schools. We must recognize indeed that in the study of the Alps, for example, neither the teacher's words (no matter how graphic), nor a map, nor a collection of photographs, nor filmstrips, nor textbooks could provide what a good educational film offers if it does nothing else—the feeling of life, contact with the environment, and the essence of the human world which comes with it. The peculiar value of film lies in its essential *dramatic* character. By means of the all-important emotions, this permits identification and understanding that would be very difficult to ensure in any other way.

For this purpose we believe that educational film could be sufficiently served by a single film room in school, where single classes or groups of classes could be taken in turn to see a show calculated to make the children feel their context. We would go so far as to say it would emotionally prepare for, and set the seal on, the school's study programme and the teacher's work. By that very fact it would encourage personal activity and the children's eager inquiries.

School Broadcasting

With school broadcasting that has already happened. The chief value of using it in schools in Italy has been that it has found means to associate itself ever more closely with greater activity on the part of

schools and children. The Rural Broadcasting Organization, founded in 1933, lost no time in equipping elementary schools for listening and in successfully providing suitable school broadcasts. By the beginning of 1940 it could be said that the majority of elementary schools were equipped for reception, and that the programmes had hit upon the exact formula for 'setting the scene' for the various interests relevant to the curriculum. Under post-war reconstruction, the department called School Broadcasting set up specially by RAI-TV (the national broadcasting corporation) for educational programmes found it necessary to start almost from scratch. That was because all too many radio sets had been destroyed, or because those which survived had been made obsolete by technical advance in the meantime. Even so, within the space of a few years it proved possible to reconstruct the entire radio network in elementary schools; within about four years a special programme was available for the lower classes of secondary schools. Thus School Broadcasting sends its elementary school programmes out daily throughout the school year, between 11 and 11.30 a.m. Some days are allotted to the first and second classes, and the others to the third, fourth, and fifth. Thursday is allotted to the lower secondary school.

Yet the greatest progress has been achieved in the actual composition of the programmes. The use to which school programmes are put has been radically altered by the criticisms of, nay the revolt against, the way in which the old Rural Broadcasting Organization used to present programmes almost exclusively tied to the 'scene-setting' or 'dramatization' of subject-matter connected with the school curriculum. Programmes now seek to draw radio's contribution to school rather from the intrinsic qualities implicit in the structure and 'language' of broadcasting itself. Broadcasting tends to-day to open up great interests to the children rather than to teach them formally; it tries to create conditions in which, as has been said, the subject-matter of the curriculum can be better understood by the children. By this means it strives for the intellectual improvement of the listener, and endeavours to encourage and guide the children's activity. This endeavour is increasingly widespread, not only in School Broadcasting proper but in all the radio programmes intended for children, including the purely recreational afternoon features such as *Settecolori* (Rainbow), which is broadcast every Tuesday at five o'clock. It makes a point of activating the listener, encouraging him to take part in the actual broadcast itself. It deals, for example, with study projects completed by a class or school on fashions, songs, traditions, legends, occupations, production, the economic life of the children's own district. Or it might deal with illustrations and documents which

a group of children had succeeded in compiling on the spring, or in connexion with a national or religious festival. Or it might concern their own contributions submitted on a theme suggested in a previous broadcast, and so forth. Inevitably, a radio programme of this sort guides the teacher himself, and prompts him to a better endeavour instead of that which is traditional—the 'lesson', to be precise, where the teacher talks and the pupils listen. Similarly, we have concerts of music more suitable for children, correspondence and discussion on school topics, personal views of children, children's 'problems'. In particular, a most successful series called *Tanti fatti* (So Many Facts) is a veritable little children's magazine, receiving news from everywhere, including new scientific discoveries, new inventions, art displays; it tries to appeal directly to children's own curiosity.

The Thursday radio programme called *Antenna* (Aerial), directed to children in the lower secondary school, is both a children's radio newspaper and a correspondence column for them. This series is also, as we might expect, mainly based upon the children's own activity, in accordance with all the recommendations of educators, without bringing mass media down to the school level of study in the dull exposition of the curriculum. There they would become just so many textbooks. They would lose their special features, and the *freshness* they can bring into the school in the very process of enriching academic inquiry and setting out school subjects better. While the teacher's formal instruction and the textbook should be fundamentally based upon the pupils' intellectual activity, the media of mass communication can and must involve the children's entire personality and interests in quite different ways.

Television in Schools

As for TV, its adoption in Italy is fairly recent. It goes back to a point five years ago, and shows two distinct phases: during the first, television services were extended throughout northern and central Italy; during the second, following a couple of years later, these services have been extended to southern Italy and the islands. To-day the whole country is within reach of television programmes, which are, however, broadcast on a single channel. This cuts down considerably any chance of more varied and topical programmes, and of course restricts the use of the most popular times to entertainment features. We should only be able to take account of this if our terms of reference allowed us to interpret the educative nature of mass media in the widest sense of education, in their influence on adults, and not more strictly and specifically in relation to the work of schools. All the same, it is worth noting (for the implications it has for schooling) that inquiries

undertaken during 1957 by RAI-TV itself into the reception of TV in Italy show that about two-thirds of children from twelve to sixteen years of age whose families have TV invariably followed the evening programmes intended for adults, and even more followed those of Saturday and Sunday evening. *Lascia o raddoppia* ('Double or Quits') broadcast on Thursday evening was followed almost universally by children and adolescents. Other inquiries have aimed at revealing the effect of this sharing by youngsters in adults' programmes; and in so far as there is no lack of complaints about negative results (such as tiredness, irritability, inattention at school, and so forth) it seems undeniable that the children have drawn and continue to draw precious elements of intellectual and character training from broadcasts.

Apart from Sundays, when TV is broadcast in Italy during the morning as well (for religious services, 'farmers' hours', and other topical items), the regular TV programmes take place in the afternoons and evenings. They run from 2 to 3.20 p.m. with *Telescuola*, soon to be described; from 4 until 6 p.m. with lighter programmes for children; and from 6.30 p.m. (apart from brief interruptions) with various entertainment programmes for adults. There is no such thing as a schools television programme broadcast during school hours in connexion with the various items of the curriculum, and viewed in school. Our only experience of educational TV has been thirteen televised lessons, directed towards upper and lower secondary schools, broadcast from April 28th to June 16th, 1955. Arrangements varied to suit the subject (such as history, physics, Italian literature, or mathematics). They were shown after school between 5.30 and 6.30, so that the children could see them at home. Furthermore, at that time hardly any schools possessed a TV set. Even to-day there can be very few that do.

The sole experiment—nay, we might say the sole schools television programme in Italy—is one without rival in Europe and, in the strict sense, even in America. It started at the beginning of the school year 1958-9 with a television course to last for three years, designed to cover by this means the whole course of a *scuola d'avviamento professionale*. This is one of the two types of school catering for children between the ages of eleven and fourteen, after the elementary school—particularly those who do not intend to take their education further.

This year we have seen the first course, with two thirty-minute lessons a day on six days a week. During these lessons all the subjects of the curriculum have been covered, i.e. Italian, history and geography, civics, elementary French, arithmetic, elementary physics and chemistry, biology, drawing, and elementary woodwork. To bring life to these lessons, and to simulate somehow the living contact between teacher and pupil which is probably the most formative element in a

classroom, but which is lacking in television, some very interesting expedients have been devised. Every lesson was taken by each instructor with a real class consisting of a fixed number of pupils (four or five), towards whom the teacher turned from time to time to ask questions; they in turn asked him for information or explanations. Psychologists have already noticed that the presence on the television screen of 'one of the public' makes it much easier for 'identification' to take place, and, consequently, a private 'television discussion' between the actor and the public, even though the public cannot actually engage in question and answer. In the case of a formal lesson, the presence of a few pupils has facilitated and developed to a surprising degree this 'identification' and 'television discussion'. Furthermore, RAI-TV had distributed the texts of the lessons to the pupils before the commencement of the course. The texts had been prepared by the course instructors themselves in such a way that anyone could follow the televised lesson with the book in front of him; in it he was provided with notes and explanations—as though public centres had been established for seeing television, but under the care of teachers, who after each televised lesson answered their pupils' questions, corrected their work, and added explanations and comments. Finally, a real correspondence course of study developed between the televised instructors and their pupils, especially by means of the weekly or fortnightly correction of homework.

The annual examinations are still a long way off, and therefore it is impossible to say with any exactitude how many of the pupils who have followed this first television course will turn up in the schools to take the examinations entitling them to pass from the first to the second class of the *scuola d'avviamento*. Only at the end of 1961 shall we know the number of those successful in obtaining the leaving certificate of that school thanks to this televised instruction. At any rate, statistics compiled by RAI-TV lead us to anticipate an 'attendance' of about 50,000 at the beginning of the year 1958-9.

We have therefore to reckon with an event of the greatest importance to education. Though not very much notice was taken of it, the opponents of the school (so to speak) were up in arms against it with the greatest determination and almost violence. Once again these people saw the traditional order of school life thrown out of joint, the regular control of attendance and promotion disturbed, with a total loss of that contact between teacher and pupil which is the irreducible foundation of the educational process, and so on. The old, familiar aristocratic and conservative attitude is anxious to restrict mass communication media to mere entertainment; it would gladly see them turned over to clowning of the lowest and most vulgar kind. Such

champions are determined to resist in the most emphatic way any influence mass media might otherwise have at the level of school or education. This brings to my mind the objection put by Pharaoh Thamus to the god Theuth (in the words of Socrates in the *Phaedrus*, 274c, 275b). When the god had discovered the letters of the alphabet, and proposed to spread the knowledge of them among the Egyptians to make them "wiser and better able to remember", Pharaoh objected: "As far as knowledge is concerned, you give the appearance and not the reality to your disciples. Through this device of yours they will be enabled to hear of many things without real instruction. They will think they understand many things, and yet (as usually happens) they will not understand. It will be impossible to have any discussion with them, because they will be philosophers only in appearance and not in fact."

The Theatre

The theatre, superseded by cinema, television, sporting events, and all the other considerations which directly affect its very structure, is undergoing a crisis to-day especially in Italy. But that gives us no reason for forgetting the historical importance of the theatre, not only in its formal influence upon the school (it is sufficient to recall the Boys' Companies in Britain before 1600, and the theatre in Jesuit schools), but also in its wider association with the aesthetic and cultural development of young people. A considerable part of the *poetry* of the whole world, from the Greeks to Shakespeare, from Spain to Goethe, from France to Dante, from Scandinavia to America, has been expressed in the form of drama. Thus going to the theatre and enjoying it makes us heed continually both the poetry and the 'message' that dramatic works have always communicated from their very beginnings in Greece to Pirandello and Shaw. The theatre has always been intimately concerned with the greatest issues of human life. It is impossible to imagine a genuine, effective school lacking the presence and message of the theatre; and I do not speak of a 'liberal' school only, but also of the other kind that is vocational or devoted to some practical pursuit.

However, Italy has never had an organization comparable with the *Young Vic* in England or with the *Dansk Skolescene* in Denmark, devoting itself to the task of providing numerous and regular theatrical performances for secondary school pupils and university students. Such opportunities have been occasional and few. Now and then there has been a morning or afternoon show for school children when some theatrical company has acted a play by a classical author such as Seneca, Goldoni, Molière, Racine, or Shakespeare; but this could happen

only in the largest cities, and is still undertaken by such companies. A bigger and more specific organization is that provided by the Little Theatre in Milan. University students in some universities stage dramatic performances. This is a record too meagre to enable us to talk of a sufficient contribution of the theatre to Italian schools and education.

Much more general, however, particularly in the elementary school, is the use of drama, as used to bring life to education and to welcome the freer self-expression and projects of the children. So is the puppet theatre provided by the new programmes in the elementary school. Here we have two activities of the greatest educational importance. However, we cannot linger over them because they concern the theme of activity methods rather than the topic on which we are engaged. As for the practice of organizing dramatic groups and getting the children to take parts, engaging them in actual dramatic performances, it appears to me to be absolutely deplorable, and a thing to be avoided at all costs. It hampers their artistic education, and in the final reckoning it can hardly be really useful in genuine character training. There is a risk in the first place of distracting them from the true field of education; the school ought in fact to open up to the children the values of the theatre as it makes them receptive of poetry and art in general, or should do. But if it were to develop in them mere dramatic dilettantism it would have the same value as if it persisted in training sonneteers and euphuists. Quite apart from the display of vanity that public speaking encourages in young children, a school indulging in dramatic activity nearly always sinks so far as to undermine the children's genuine taste for theatre and poetry. This is true both of infant schools, which become unattractive instruments of amusement for adults, and of senior schools, which lose interest in the genuine work of the artist. For this they substitute rivalry, exhibitionism, competitiveness, envy; and they end by making "a comedy within a comedy", to use Goethe's words. To say no more, teachers of any sort who set themselves up as producers and directors of children's drama have no special competence in this regard, and are no more than amateurs themselves. Thus interpretation of the drama on the children's part runs the risk of being a mere external show, with standardized mannerisms copied directly from the teacher, and with dictated intonation put into their mouths by him, and so forth. To get inside a dramatic text, as drama, implies a great deal more than mere understanding of a text as literature; and though a school, doing its job well, can introduce the children to a proper insight into the text, it nevertheless strays far from its real duty when it tries to get them to understand it as drama. That is an intellectual exercise beyond their

capacities. One can read and listen to *Hamlet*; but to interpret it, to penetrate into the dynamic essence of *Hamlet* as drama, is quite another matter. Goethe also says: "It almost happened that there was no more than a merely verbal elocution, based upon a few movements, and not expressing the sentiment at all."

All this criticism, however, is not aimed at the productions which in the best of British and American colleges generally help the students to embody, so to speak, their literary studies. They bring to life the classics of Greece and Rome, and also (why not?) modern authors in the original tongue, for the most part, as in the best of the Italian *licei*. In these examples we are dealing with a real academic activity of the most genuine kind, helping to ensure a better understanding of the works studied as ancient or modern literature, a better diction, a more exact pronunciation, and in short, a greater expertise on the part of the students.

Other Mass Media

A fuller account than the present of the media of mass communication for educational purposes in Italy would necessarily speak also about filmstrips, records, and pupils' newspapers. We shall confine ourselves to a few lines. In the present post-war period, filmstrips have had an exceptional vogue. Projectors have been put on the market for very modest prices, with screens that are easy to erect, and the widest variety of filmstrips in black and white or colours on every subject. Consequently, innumerable teachers have acquired one at their own expense to help in their teaching, much as doctors buy stethoscopes or instruments to test blood pressure. At least ten publishing houses have set up their own film departments, based for the most part on slides, filmstrips, and projectors for them. Kindergartens use them to illustrate stories, and to draw the children's attention to domestic life and animals. (However, those teachers of infant schools who make use of the vast resources of coloured figures mounted on cardboard which are so easy to obtain commercially are doing something that suits their work better; slides and screens are not in my opinion suitable for children of four or five years.) Elementary schools make use of them to enrich the contributions made by the children's own researches on topics studied.

As for records, some of the most recent developments have offered schools poetry readings, or indeed, whole masterpieces of the poets spoken by great actors, or genuine anthologies of the history of music; but the use of these is exceedingly rare. A venture which seems likely to have greater success is the growing practice of following up school manuals with records used as a summary, by means of which the pupil

can more easily prepare for his examinations. Similarly, one of the most commonly asked-for presents is a tape recorder, which young people love to work, as they do a record player; yet the use of such an instrument in schools by teachers of foreign languages is most unusual—always for the reason previously mentioned—namely that of cost.

A longer article would no doubt touch on children's newspapers, not only those intended for amusement but those of directly educational purport. These are in very general use to-day, owing to the widespread use of the Freinet process, and in general by the use of printing in schools. We ought also to mention the adaptation of *fumetti* for educational use; they are used to portray the life of Garibaldi or the discovery of America and similar themes. But in general, Italian teachers have not regarded these experiments with favour. The writer feels it his duty to persuade them how mistaken they are.

LUIGI VOLPICELLI.

Educational Tradition and Mass Media in Poland

POLAND is a country with a proud tradition of 'object teaching', for since the seventeenth century, when they started the publication of Comenius's *Orbis pictus*, various efforts have been continued to overcome the limitations of verbal instruction.

These efforts have followed two main courses. First, they have aimed at supplying to children and young people pictures of things they learn about. Illustrated material, originally contained in handbooks and reading books, has recently been offered in the form of separate cards and sheets. In the twentieth century in particular, Polish schools have had at their disposal an enormous amount of illustrated material, both black and white and multicoloured. Some of these sheets have become a changing or even constant element in the decoration of classrooms, halls, and common rooms, while others, closely associated with courses of instruction, have been used during lessons and by pupils in handicraft rooms and school laboratories.

However, of particular importance in Poland has been the other line of approach to overcoming verbalism in teaching. This has aimed at creating a rich stock of teaching aids collected or built by the school children themselves with the help of the teacher. These aids varied widely in character according to the subject taught. Sometimes they were collections of certain materials such as plants, butterflies, or minerals; sometimes photographs or diagrams of things the pupils were to learn about. Occasionally—and this category was more interesting and pedagogically more valuable—they were models which illustrated various scientific laws. Such models, often very ingenious, were constructed for teaching not only physics or chemistry, but mathematics as well, including geometry. Some of these models were specific mechanisms which might be set in motion and thus help to understand natural laws.

Difficulties in Introducing New Media

The pedagogical traditions in Polish schools have determined the conditions under which modern mass media of communication could be introduced. While favourable in many respects, these conditions proved rather adverse in others. The teaching staff on the whole

welcomed everything that helped to illustrate instruction, as the tradition of using illustration in the school had always been very strong. This accounts for the wide popularity of photography of all kinds. But there was much mistrust about other modern mass media, e.g. radio. Used to conducting instruction personally, the teachers feared that the use of broadcasting would enhance rather than allay the danger of verbalism. Voices could be heard expressing profound reluctance to use radio, and apprehension that the introduction of broadcasting to schools might be the first step towards the mechanization of teaching and the substitution of a pedagogical robot for the living teacher.

The film was in a peculiar position. Highly valued as 'improved' illustration, many raised objections to it because of the relatively high speed of presentation which hampered the study of details. The use of the film, and the knowledge of how to read it, assumes a certain quickness of perception, and some teachers were of the opinion that no such qualifications could be expected of children and young people and, consequently, demonstration by diagrams or charts was preferable.

Thus the attitude of most teachers to modern mass media of communication has been a mixed one ever since. Welcomed on the one hand as better teaching tools which helped achieve didactical objectives better than any traditional means, these new media were feared to weaken activity in children and young people and to contribute to the development of new verbalism, a verbalism based on modern technical means.

As time went on, confidence in the modern mass media of communication grew, and so did willingness to make more use of them in the school. Yet this process was and still is rather slow. This has been due mainly to the fact that the equipment of schools with these media is studded with great difficulties, organizational and financial, and so the teacher finds it difficult to add to his experience with the media. Thus, film shows in the school require not only an adequate repertory of films—which are relatively easy to get—but also a projection room in the school; it is true that a film may be shown in very bad conditions as well, but we all know that it is then extremely difficult properly to conduct a lesson and very easy to discredit the whole business.

It should also be borne in mind that the material difficulties in creating proper conditions in the school for making use of mass media cannot be easily remedied by *ad hoc* measures. If, for example, the use of films is not an everyday routine in a school, if it is a rare practice, it becomes quite an event in the life of the young who treat a

show as a curiosity and not a lesson. This is precisely why attempts at organizing travelling cinemas or trips to other schools (or to other institutions) to attend film projections have failed on the whole. The practice has proved acceptable in the case of feature films, otherwise the benefit has been next to none. The modern mass media must become part and parcel of a school's everyday life or they will bring failure and disappointment.

Thus, the inadequate material equipment of schools limits the possibility for mass media to be used and undermines confidence in them. Mass media call for good conditions and first-class equipment, without which no good results can be achieved.

For these reasons the popularization of mass media in the Polish schools has been a rather slow process. A striking disparity has developed between a very active and creative group of pioneers of these methods and the mass of teachers, who work in conditions which hamper the use of these means. The composition of the pioneer group is extremely varied, as it consists of popularizers of science and men of letters, artists, and teachers. Men of creative, inventive talents preponderate in the group, and that is why the standard of our film production is out of all proportion to the volume of consumption. We get incomparably more first-class films popularizing science, aiding instruction and education, etc., than there are good school projections of them or than there is skill to make good use of them. Some of these films win high awards at international competitions and festivals, but there are few schools which are able and know how to show them.

There are many cleverly produced broadcasts of all kinds for children and young people in Poland, but the schools do not make use of them as often and as well as they ought to. Some of the most active pioneers work for the Polish Radio, where they produce broadcasts for children and young people; others work for the Polish Film, where they take up the production of educational films; others are teachers teaching in well-equipped schools in some of our big cities; still others work in the Ministry of Education. Thus their activity goes on at various centres, and this has many advantages, though it is far from typical of educational relations in Poland, where the tendency to centralization is rather strong. The Ministry of Education, which regulates curricula in great detail and has the power to approve handbooks for schools, has only recently paid more attention to the co-ordination of scattered efforts, better equipment of schools, training of teachers and securing assistance to authors through the popularization of their works in school practice.

*Reproductions, Photographs, Slides, and Charts*¹

There is not a single school without at least a basic stock of reproductions and charts, and most of the schools have apparatus at their disposal for using slides and other visual material.

Reproductions, photographs, slides, and charts are helpful in the instruction of all subjects, and their character varies widely. Thus, the pictorial material provided for teaching Polish to elementary school children covers basic rules of good behaviour and conduct (e.g., a chart entitled *Children Help Their Parents*), hygienic guidance (e.g., *Hold Yourself Upright* or *Wash Your Hands Often* charts), illustrations for reading material, including fairy tales, portraits of writers well known to the young, pictures of regional life, clothes, scenes from contemporary Poland, rebuilt towns, factories, etc. Some of the charts are meant for teaching the alphabet and spelling, and are movable.

The history teacher has a vast amount of pictorial material at his disposal. He has pictures of ancient monuments, plans of towns, excavations, technical tools and methods of work of the past, pictures of everyday life, styles of furniture, lay-outs of interiors, etc. A set of such plates makes it possible to demonstrate the whole of mankind's progress and also the historical development of the mother country as well as its present-day situation. Particular stress is being laid on a vivid presentation of various kinds of human work and of various branches of the national economy.

Good diagrams are also used by teachers of the natural sciences. They help better presentation of theoretical problems as well as practical issues, and especially the relation of the natural sciences to industry. Charts demonstrating the importance of various physical laws to technological progress have been carefully drawn up.

The school film is not so popular as photographs, diagrams, and slides, but it has recently become more frequently used as a teaching aid, and the stocks of school films have been growing fast. Also their scientific and pedagogic standards has been rising and many of them show their authors' and producers' rich creative invention. Systematic work has also been started to help the teachers to use films in class in an educationally valuable manner. The Ministry of Education is just preparing a large book of about fifty-two publisher's sheets which give an analysis of 320 films and guidance on how to utilize these films in school work.

One characteristic of these films is concern with aesthetic education. There are many very fine films which serve this purpose, the realization

¹ Data on illustration and film materials have been prepared by Mrs. A. Podgórska, Ministry of Education.

of which in the school is by no means easy. Some show the life and work of prominent painters and sculptors, others take the young spectator to the artist's studio and try to initiate him into artistic workmanship; still others present work on the reconstruction of priceless monuments of the past, or on the rebuilding of ancient Polish towns destroyed during the war. A number of fine films depict the art of former centuries—there are films featuring Gothic art, the art of the Renaissance, Warsaw paintings by Canaletto, etc.

A desire to show contemporary life, above all in Poland, is another characteristic of the Polish school films. We produce films which present different kinds of work, various industrial centres, the organization of trade, transport, research, health services, etc. To many school children living in small towns or villages they are the proverbial 'window to the world', as they widen the horizons of their knowledge of the contemporary world.

It is also characteristic of our school films that they tend to show, as vividly as possible, the working and the social importance of pure and applied science, such as films showing map-making, weather forecasting, work at astronomical observatories, the presentation of Newton's law or the story of a drop of water. Some of these films are intended for younger children and make a fairy-tale approach, e.g., a film called *The History of a Little Snow-man*.

In addition to films used directly for the purposes of instruction and connected with the curriculum, there have recently been a growing number of feature films, both Polish-made and imported. Of the former, puppet films are particularly popular and a favourite with children. As more and more children and young people have the opportunity of seeing feature films at school or in public cinemas, discussion becomes increasingly brisk on the principles of the selection of these films and the criteria which help to decide what films suit which age. Various standpoints become apparent in this debate varying from very tolerant to very rigorous.

Roughly speaking, broad agreement has been reached on the following principles of accepting films for children and young people: (1) a film should be easy and comprehensible to the young as regards its subject-matter and production, and should comply with their interests; (2) it should add to their knowledge of their country and the world, of people in various environments and conditions and should encourage reflection; (3) it should have a basic humanistic angle, and even when showing evil or crime it should pose moral problems in a resolute and not relative way; (4) it should bring about aesthetic experience and help acquire good taste. In accordance with these principles films with difficult, complex psychological problems, with brutal or macabre

scenes, with a low type of humour and with no distinct judgment of moral values when their subject-matter calls for such judgment, should be avoided.

Practically, these principles do not always lead to the same conclusion on the suitability of various films for various age-groups, but they do supply a basis of agreement on this important educational issue.

*School Broadcasts*²

The Polish Radio broadcasts a rich and varied programme catering for separate groups of listeners, i.e. children of five to six, those beginning at school (aged seven to ten), pupils in the upper forms of the primary school (aged eleven to fourteen), the young attending secondary schools (aged fifteen to eighteen), and adolescents already employed.

The broadcasts are varied not only in accordance with age; there is also a great variety of content. There are broadcasts closely connected with various subjects of the curriculum which enable the teacher and his pupils to go beyond a handbook and other books accessible in the school library, to get in direct touch with the living progress of science, to learn about the most recent research and discoveries. There are semi-fictional broadcasts constituting serialized narratives, and there are radio adaptations of well-known novels favoured by the young. Of these, Andersen's stories, *The Heart* by Amicis, *The Story of a Fisherman and a Goldfish* by Pushkin, in particular, have enjoyed much popularity. Other broadcasts introduce the young listener to musical culture and present prominent musical compositions with suitable commentaries, and still others are recitals of prose or famous poems. There are also broadcasts devoted to technical culture, such as a series entitled *Interesting Things for Those Interested*, to discussions on problems of youth such as the series *On Problems of Youth—Quite Loudly*, there are plays adapted for radio, comedies, and also detective features, bearing in mind the educational requirements, etc.

Literary broadcasts have become very popular in which young men of letters take up moral and social problems concerning the young, the problems of their attitude to life, friendship, relations between boys and girls, responsibility for one's own and other people's conduct, etc. Some of these features have become starting-points for brisk debates, continued in youth circles, and have won significant importance as attempts to deepen moral life. Urgent problems of the young current

² The discussion of the role of broadcasts is based on a study prepared by Mr. J. Kubin.

throughout the world, the anxieties of the young generation, their quest for new conduct in life, and the questions they ask of life have received more convincing answers in these broadcasts than those the young heard at school from their traditionally minded teachers. Thus these broadcasts played an important part, above all in a period when our young needed particularly sound educational assistance and care.

The growing number of broadcasts for children and young people accounts for many discussions centred round the need for a more accurate determination of the principles of co-operation between the school and teachers on the one hand and the authors and performers of radio programmes on the other. By various methods, including inquiries and abundant correspondence with the listeners, opinions and wishes of children and the young have been sounded. These discussions have led to certain conclusions concerning the rules of co-operation between school and radio.

It has been agreed that broadcasting may not and should not replace the teacher, should not give what the teacher may and should offer in class; it cannot teach how to write or read, or do sums; no radio feature should deal with subjects calling for the complex thinking involved in mathematical demonstration, generalization, detection of similar and common characteristics, etc.; neither is it relevant to broadcast purely informative programmes offering facts which the pupil can easily look up in his handbooks or find in the teacher's exposition. Broadcasts should rather be a factor arousing and stimulating thought than systematically shaping it. It is the objective of broadcasting to enliven and vary instruction, to introduce—to some extent—the elements of expression and drama, to develop imagination, to mould personal and collective interest in the contemporary world, science, art, and technology.

Based on these principles, co-operation between broadcasting and school bears fruit despite the many difficulties which still remain in its translation into practice. In addition to technical difficulties due to the equipment of schools with receivers, there are pedagogical difficulties. Teachers are still inadequately qualified for the difficult art of making use of broadcasts as a means of instruction, and find it not at all easy to include them in courses of lessons in a natural way. Frequently they are a certain 'extra' to a normally conducted lesson. There also appear a number of organizational difficulties such as the timing of the school time-table with the hours of radio programmes, etc. These difficulties are not so serious in the case of those broadcasts which are not directly connected with what is taught during a lesson, but can be linked with extra-curricular items. But there is still trouble with listening as regards both types of broadcasts; investigations have

shown that it is more difficult for children and the young to listen to and follow broadcasts than the teacher's spoken word. These difficulties must be systematically overcome, not only by younger children but also by the older ones, for in both age-groups much important content fairly easily escapes the attention of unprepared listeners. For this reason it is essential that the broadcasts should be particularly carefully adapted to the general level of the listeners they are meant for, that they should suit their interests to attract their attention, that they should interest and move them.

Despite these difficulties, co-operation between radio and school makes good progress. We have no exact figures to quote here, but we have good reasons to believe that more than three-quarters of kindergartens equipped with radio receivers make permanent use of broadcasts, and so do a great number of primary and secondary school teachers. One hundred and seventeen schools throughout the country have recently got in close touch with the people responsible for broadcasts for children and the young. They have answered detailed questions about which were the best broadcasts in the previous year, how much the children liked them, and how they were made use of in school work both within and outside the curriculum. This co-operation of the front-rank schools with the radio is very promising.

Other Media

The other mass media are considerably less popular. The gramophone is used in a certain number of schools for teaching foreign languages as well as for recitals of literary compositions. Thus school children are given the opportunity to listen to correct pronunciation and a fine interpretation of literary works with which they are familiar. Television is still very little known; the network of television stations is only beginning to extend throughout the country and the teachers have no experience in this field. Telecasts play a somewhat more important role in youth clubs, but here, too, only the very first steps are being taken towards a more systematic utilization of the possibilities offered by television.

The role of museums deserves special mention. It is true that they are not usually considered modern mass media as they are an institution of much earlier origin, but one cannot fail to notice that their role has recently been changing. The social influence of museums increases, and in addition to collecting and preserving valuable things their task nowadays also consists in securing access to these by the masses. The Polish museums serve this purpose increasingly well. In most museums there is a special department called educational service, intended to make contact with the public and school children in particular. A

number of schools in large towns co-operate with museums in organizing systematic tours, sometimes very closely connected with the curriculum. These educational functions are fulfilled by all kinds of museums—museums of art, of technology, and of history; there are also special museums devoted to prominent artists like Mickiewicz or Chopin which are frequently visited by young people. Young people who come from the country to see our cities usually include visits to major museums in the programme of their trips.

General Remarks

It follows from the survey we have made that the role the mass media play in the Polish school is growing, and although in some fields, for example in television, we lag rather far behind, we have gathered interesting experience in others. We can see very plainly that the mass media help to level the disparity in educational and teaching conditions that previously existed between schools in large cities and those in the country. We also realize that the use of these methods introduces more elements of modernity to instruction and education, secures closer contact with the world and with progress in science, and a chance better to experience the arts of literature and music.

Our teachers are slowly getting accustomed to the use of these methods, and convinced that they are useful aids to their work in and outside the school, and are good instruments for developing intelligence and imagination in the young. Numerous groups of enthusiasts for these modern media exist, and their initiative is particularly fruitful as regards the film and radio. The Ministry of Education is a propagator and co-ordinator here, the initiative itself resting with various institutions, circles, and individuals. The question is being asked whether a certain amount of centralization of efforts would not be desirable, but things do not seem ripe enough yet for it to be introduced.

At the same time attempts are being made to study the educational value of the mass media. A comprehensive study of the role of broadcasting in the school has been prepared in the University of Warsaw Institute of Pedagogical Sciences, while the Chair of Didactics in that Institute is starting a detailed research into the utilization of the modern mass media in schools of various levels. No doubt these studies will give us a better understanding of the complex relations between the use of these methods of instruction and the mental and emotional development of the young, and thus we shall be able to apply them even more efficiently.

BOGDAN SUCHODOLSKI.

Mass Media in Swedish Education

THE setting is a small rural school in the sparsely populated northern parts of Sweden. A small village with about twenty families and a few neighbouring farms provide the school with something like fifteen children. They attend a type of all-age school. Every second year there is a new intake to the school, which is run by one teacher. These schools are few, but they exist.

In Stockholm a school population of 1,500 in one school is very common. A class of thirty-five children in a school in the southern suburbs of the capital contains all grades of intelligence except retarded children. In this part of Stockholm the comprehensive school (*Enhettsskola*) has been introduced, and during the first six years there is no differentiation according to ability or intelligence.

These two pictures show the contrasts. In the small rural school the teacher is alone and needs every help that mass communication media can give, but mostly his school is poorly equipped with these aids except for a radio set. His colleague in the town is more tied up. There are frequent visits from students in training. There is a general feeling of unrest among the children, caused by the pressure of a hectic life outside the school which creates disciplinary problems. Mostly there are audio-visual aids at hand, but when and how are they used?

Children start school in Sweden when they are seven. The school leaving age is still fourteen, but the comprehensive school with its nine compulsory years is growing rapidly (in 1959, 25 per cent of the school population). By law it is prescribed for the whole of Sweden, but it is being introduced gradually. On top of the seven-year *folkskola* there is a middle school, leading to an examination comparable to the English General Certificate of Education. The higher classes of the grammar school take the pupils to the *studentexamen* at the age of nineteen or twenty.

As far as aims, curricula, and methods go, Swedish education conforms very much to the general pattern of Western civilization. A good general education, training in social life and in citizenship, and regard to individual freedom are some of the fundamental aims. But being a small country there are of necessity a few other things to consider. One is the teaching of foreign languages. First, the neighbouring Danish and Norwegian languages must be mentioned. There

are no strict demands, but a certain amount of time has to be spent on reading and learning to understand these languages. There are, of course, many similarities in writing, but it is not possible to understand the spoken word—particularly Danish—without training. Far more time has to be spent, however, on English, German, and French. Both English and German are compulsory in the middle schools and at the *gymnasium*; French comes as the third compulsory language. On the classical side of the *gymnasium*, Latin and sometimes Greek is added. This extensive language teaching creates a need for audio-visual aids.

Textbooks and Pictures

Most audio-visual media originate from a common source. Comenius is often quoted for his great interest in illustrated textbooks. This medium—the textbook—is still the most personal and best companion to millions of school children all over the world. The dull books of our grandparents' days are now superseded by lavishly illustrated books. In Sweden this development has gone too far, according to some critics. An abundance of pictures, a lay-out of attractive face-value, and a conventional text do not create a good textbook. Every picture must fulfil a certain purpose, and the teacher has to take advantage of the additional value the picture can give. Very often the illustrations just pass by. There is in a modern textbook of history a reproduction of Napoleon's coronation, painted by David. This picture can in a nutshell provide material for a survey not only of the political events but also of the religious and cultural trends of the time. But this opportunity is missed if the teacher confines himself to the accompanying text: "One can see Napoleon crown his first wife Josephine, after he has himself been crowned by Pope Pius VII who is sitting behind him. The coronation took place on 2 Dec. 1804."

Besides these textbooks of traditional but now modernized type come several kinds of picture-books. They are mostly intended as supplements to the textbooks and the pictures can be cut and placed in the childrens' own scrapbooks. Again, an extended use of these picture-books may kill the necessary work on the core of the subject and just leave a diffused impression in the minds of the pupils.

Modern photography has reached a very high standard in newspapers and magazines. In civics and in natural sciences the alert teacher finds ways to illustrate his teaching by using this daily and weekly supply of pictures. A corner of the blackboard or a special wallboard is used. Under the headline "Events of the Week" the teacher and the pupils keep up a picture-reel. Apart from the actual contribution of pictures, this idea stimulates the children to look for useful illustrations.

Filmstrips

A visual aid of established standing and with outstanding advantages is the filmstrip. In Sweden filmstrips have been used for a long time. They now cover all subjects in the school curriculum. The necessary apparatus is available in the majority of the schools. Most of the filmstrips are in black and white. The recent development is the use of colour pictures. This is a particularly great improvement in art teaching. Series in geography and nature study have also been issued in colour with success.

An extension of the use of filmstrips for the lower classes has recently been introduced. In order to create activity among the pupils and to get training in dramatization, each child gets a printed card. Each card corresponds to a character in a story told in a sequence of pictures. Take, for example, "On the Train". One of the pictures shows the conductor just entering the compartment. "Your tickets, please."—"At what time will the train arrive in Stockholm?" There are elaborate questions and there are also more simple questions. Thus even the weak children get a chance to take part and play one of about twenty roles in the story. They learn their parts by heart in advance, and when the filmstrip is shown and the train starts, both crew and passengers are eager to take part in the journey.

Pictures from textbooks and magazines, postcards, coins, etc., can with advantage be shown in the episcopes. Historical documents, printed menus, letters from pen friends, and other odd things can be presented by using the diascopes. It takes little effort to arrange such a show, and for the inventive mind there is always a supply of pictures at hand. Teachers who find the common filmstrips too long, cut and frame single pictures and use them one by one to suit their needs better.

Films

School films have been used in Sweden for about thirty-five years. It has been the same development here as in most other countries. In the beginning mostly foreign films were available, but very soon the Swedish film companies established special sections for school films and started their own production. All the time there has been importation of educational films because home production has not been sufficient to cover the needs of the schools. There has recently been a severe drop in the home production of school films. In 1946-51 a yearly average of twenty Swedish films was produced. In 1952-5 the figure dropped to an average of ten. The importation of foreign films has also dropped. This state of affairs has caused some anxiety. In order to investigate the situation a committee was appointed by the Royal

Board of Education (R.B.E.). In 1957 this committee delivered its report and made some recommendations. Until 1953 the school film developed without any official control. From that year on, school film producers and other producers of short films of educational value were invited to submit copies to the R.B.E. for critical evaluation. Producers of filmstrips were included in this procedure. A list of approved films and filmstrips was established to help the schools in making their choice. During the first period of screening many films were found to be technically and pedagogically obsolete. The present list reveals how different subjects are covered. In history there are thirty films about historical events, and there are the same number on the related subjects, civics and social science. In geography Sweden is well covered, while films about other countries are very much dependent upon import. Western Europe and U.S.A. are fairly well represented. Zoology, botany, and domestic science have a satisfactory number of good films, many of them imported.

One group of schools is very well provided with films for instructional use. They are the vocational schools. One of the reasons for this fact is that many industries find it worth while to spend money on films for advertising purposes. They can afford to produce good films, and usually these films are an excellent aid to the vocational schools.

The distribution of school films is now well established. There are both regional and local centres where films can be hired. The film companies either sell the film or lend it for a moderate fee. More than 70 per cent of the schools have access to a film centre.

For the grammar schools there are also other ways to obtain films for language teaching. Foreign embassies usually have a good film library and films can be hired at a very low cost. Very often there are good colour films on the list.

Foreign films are also used by organizations for adult education. Printed texts with the film dialogue are provided in order to give the students the opportunity to prepare for the film in advance. Films are shown without Swedish captions, such as *Good-bye, Mr. Chips*, *Quiet Evening*, and *Trio*. Many grammar schools also make use of these films.

As already mentioned, investigation has shown that there is a severe drop in the production of new films. It has been suggested that the State should give subsidies to the film companies to enable them to produce more and better school films. So far these plans have not materialized.

At the same time there is a development to improve methods of using films. There are still many film hours when a programme is

composed of about half a dozen films and shown to a large audience at one showing. But the aim is to use just one film at the very moment it is needed in order to illustrate a certain part of the curriculum. This ideal is certainly not remarkable—but it is just a question of a sufficient number of projectors, of the right film at the right moment, and of planning and follow-up by the teacher. Many instructional courses have been held to teach the teachers the technical and pedagogical use of school films.

Two special language films have been produced for the teaching of English and French respectively, *English by Film* and *Le français par le film*. The idea behind these films was certainly good and they might have proved a new departure. But people with lack of competent knowledge were engaged for the task and made the results less satisfactory. A later film, *How to Teach History*, has proved a greater success.

The Gramophone

The oldest purely aural aid is, of course, the voice. Before the era of technical devices there was just the teacher's voice. Only on very rare occasions a guest turned up in the class and a new voice came as a stimulating interruption in the monotony of the daily routine. Now there are plenty of voices—from the gramophone record, from the radio or the tape recorder, from the visiting instructor or the dramatic group of the school.

The gramophone has three main uses in Swedish schools: first, to play back voices of famous people or of good actors reading poetry or extracts from drama; secondly, in language teaching; and thirdly, in the presentation of music. The music teacher in the grammar schools has generally established a listening routine as regards musical appreciation. A radio-gramophone of good quality is standard equipment in most of these schools. The works of great composers are presented and analysed. A very special use of the gramophone is to reproduce the songs of birds. Most of the birds found in Sweden are recorded by the Radio of Sweden on gramophone records. Many teachers in natural science have used this opportunity to improve their own and the children's knowledge of birds' songs.

School Broadcasting

Thirty years ago school broadcasting started on an experimental basis. The first trial years proved successful enough to justify a regular service to all kinds of schools. Since then it has grown to its present-day importance. There are now thirty programmes a week covering the stages from the infant school to the grammar school.

The Radio of Sweden is a national network, based on licences. The listening schools have to pay their fees. Practically every single school in Sweden has its receiving set. The large schools are generally provided with a central radio installation with loudspeakers in each classroom. This central radio system has not always proved to be good. The main set is sometimes placed in the head master's office. To run in and out in the head's office in order to start, adjust, or cut off a programme can create disturbances and be a bad influence on listening. The teachers' common room or the office of the school warden is a better place. The small rural schools with single sets in each classroom have the best listening conditions.

The school broadcasts differ in one way from the ordinary radio programmes. There are always written introductions and pictures in a pamphlet to support the radio lesson. This aid to listening varies according to the nature of the broadcast. In the case of a dramatization it may be just the cast and a presentation of the main ideas of the play. Sometimes a few pictures are added. In geography programmes there are usually about eight pictures to illustrate the programme. These pictures are used in detail by the speaker and 'sucked' out. This is possible, as the most frequent type of production in this subject is 'reportage', which is mainly done by members of the school broadcasting staff.

This combined use of sound and picture is a very significant trend in Swedish school broadcasting. It is made possible through the wide circulation of the pamphlets. For the *folkskola* three different pamphlets have been issued each term: one for the lowest stage (the first two school years), one for the second stage (third to fourth school years), and one for the higher stage (fifth to ninth school years). From the autumn term of 1959 the three stages will change a little to conform to the stages of the comprehensive school (one to three, four to six, seven to nine school years). The pamphlets include all kinds of subjects. Music, however, is excluded from the two latter pamphlets, as all songs and music illustrations are collected in a special pamphlet. The editions of the three general pamphlets amount each term to 800,000 copies, while the music pamphlet, issued once a year, amounts to 400,000 copies. Compared with the number of pupils in the corresponding classes, this means that about 90 per cent of all children have their own pamphlets. The large editions and calculation based on cost price make this wide circulation possible.

From the very beginning of school broadcasts the Radio of Sweden has been working in close co-operation with the R.B.E. This body is consulted when the Head of School Broadcasting is appointed. This latter official is called upon to attend conferences at the R.B.E. when

important issues are discussed regarding the place of school broadcasting in the educational system. There is always a mutual and close exchange of plans and ideas between the official of the R.B.E. who is responsible for the audio-visual education and the H.S.B.

The planning of the programmes is the concern of the Radio of Sweden. There are, however, two advisory committees appointed by the Radio of Sweden. One covers the field of the *folkskola*. The other works for the grammar school. Both are representative bodies. The final plans are submitted to the R.B.E. for approval, which is merely a formal procedure.

As regards secondary schools there has been a dominance of language programmes. Again we find here the need to support the intensive work of teaching three foreign languages besides Danish and Norwegian. Special pamphlets are issued in English, German, and French. For a long time the fixed time-table in the grammar schools prohibited a fairly wide use of the programmes for higher schools. The tape recorder has solved this problem. Most schools have now at least one recorder. Mostly the programmes are recorded by one of the teachers. Lately the Radio of Sweden has started a service for the schools whereby they can buy at cost price a recorded programme. This service has so far been on an experimental basis. Its success seems to guarantee not only a continuation but also an extension to other schools. One of the main reasons for this service are the rather unsatisfactory listening conditions in remote parts of Sweden. Local recording centres have also been started in Stockholm and Uppsala, and other towns seem to follow. At least in Stockholm this service has increased interest for school broadcasts.

The number of programmes covering subjects like religion, philosophy, Swedish literature and drama, natural and social sciences has increased. Particularly has this been the case in history. One great responsibility of radio is to make use of archives of recorded modern history. To listen to the voices of Chamberlain and Hitler in the Munich days of 1938, or to Churchill and Hitler throughout the Second World War gives a supplement to the history teaching which no other means can give. And to illustrate current events regularly is another feature of the service that school broadcasting can give.

Twice in recent years the school broadcasting authority has issued a series in art appreciation. The first one was called "The Painting and the Time". The collection included ten colour reproductions from the fifteenth century until modern times. This collection was sold to the schools at a low price, which made it possible for the schools to provide whole classes with sets of reproductions. The programme content was

a broad cultural survey of the time mirrored in literature, in music, in philosophy and, of course, in the art of the period.

The latest series during the year 1958-9 has concentrated on Swedish art. It started from a modern glass wall painting, finished in 1957, and went back to the 1870's. Again a fully integrated cultural survey was a dominating feature of these programmes. The difficulty with both series has been that very single-minded teachers have not been able to reach the broad integrated approach and they have hidden themselves behind the excuse: "This is not my subject." The art teachers, however, have proved to be the most enthusiastic listeners, and in many schools reports have given evidence of a full use of the two series well in keeping with the intentions of the school broadcasting staff.

The Teaching of English through Broadcasts

During the last ten years there has been an important development in the teaching of English in Swedish schools. In the grammar schools English has been a compulsory language for many decades. In the *folkskola*, voluntary teaching of English started gradually in the beginning of the 'forties, but to a very small extent.

In 1949 the Radio of Sweden launched a large-scale experiment with a combined course of radio and correspondence teaching for the *folkskola*. Teaching English in a grammar school has always required an academic degree as a qualification for the teacher. The assistant teacher in a *folkskola* with his training college education lacked this qualification. But a kind of lower certificate was introduced for these teachers. Young teachers were particularly eager to qualify for this certificate. From the beginning of the 'fifties more and more schools took up English. In 1955, English was made compulsory from the fifth school year (equivalent to 11+).

In the meantime the combined radio and correspondence teaching had grown, and was thus prepared to meet the demand from the very large number of schools where no competent teachers were at hand, as was the case with many rural schools.

This part of the school broadcasting service is now well established. During the school year 1958-9 approximately 17,000 in the fifth class, 15,000 in the sixth, and 6,000 in the seventh class were taught English in this way. The classes have five periods of English a week, of which two lessons of thirty minutes' duration come over the radio. The class teacher must of course have a good working knowledge of English, as he has to run three periods by himself. He has enough to do with the follow-up work and the preparation given by the radio teacher. The radio teachers are hand-picked from among highly qualified teachers in grammar schools. Textbooks provide a necessary frame for their

teaching, but they have great freedom to develop their own initiative and make full use of all the resources of the radio as a teaching medium.

Listening in a class soon gives an impression of the collaboration between the radio teacher, his 'English voice' (if the radio teacher is a man, the assistant is a woman, and *vice versa*), the class teacher and the children. The pupils are kept very active by the questions they have to answer, the chorus reading, and the tasks they have to perform ("go to the blackboard, please"), the questions they have to put ("ask me"), words they have to underline in the vocabulary, etc. When the radio teacher has put a question, ample time is given for the pupils to answer, and if necessary the class teacher passes over the question. The pupils very soon get used to this system. From the opening tune and the greeting, ("Good morning, boys and girls" and the answer "Good morning, sir") they are actively engaged.

Continuous contact is kept with the class teachers in several ways. One member of the school broadcasting staff visits schools to get first-hand impressions of how the teaching is going on. His task is also to advise the teachers. All over Sweden a number of about fifty advisers are engaged for the same task. They are allotted a small number of schools in the vicinity of the town where they serve as teachers in a grammar school. They pay visits to the English classes in their spare time and report to the Radio of Sweden about their impressions.

About five times every year a printed leaflet with exercises and questions is sent out to all pupils. They are designed like a test, but though they are corrected and evaluated they only give hints to the teachers about the standard of the class. The chief aim of the exercise is to be a stimulating contact with the radio teacher and the central staff.

Several evaluations have been made as to the result of this teaching by radio. In the third year of English the pupils from the radio classes are very often moved from small rural schools to centralized schools. Here they are put together with pupils who have been taught by a fully qualified teacher. Again and again, head teachers report the very good results of the radio teaching. At the University of Uppsala two investigations have been made to compare the results of radio teaching with the ordinary teaching of English. The investigations have turned out favourably for the radio teaching.

In order to give a similar service to qualified teachers a course has recently been started, adjusted to their needs. It takes place once a week, and it is based upon the most common textbooks. These courses are voluntary and give all the facilities that radio can offer. On the other hand, the teachers are completely free to form their teaching as they like.

The decisive factor in this radio teaching, and particularly in the regular three-year courses, is the interest, initiative, and thorough work of the class teacher. If he is really active, his pupils can achieve splendid results. But sometimes very poor results are reported by the advisers. Mostly this depends wholly on the class teacher. In a few cases there have been too many retarded children in a class, and in such circumstances the average result in a class becomes low.

School Television

Experiments in school television have been made in Sweden in 1951 and 1957. On the first occasion there was a minimum of resources available, and the pioneer experiment was confined to five programmes amounting altogether to one hour. The 1957 experiment lasted for three days. A regular TV service had by this time been in operation for two years, and the resources and experience of the TV staff were put at the disposal of the leaders of the experiment. In this experiment emphasis was laid on two geography programmes: "To Understand a Map" and "The Suez Canal". In the latter programme there was a deliberate effort to combine historical, geographical, economic, social, and political aspects. The experiment was followed up by a questionnaire. Only about a dozen small country schools had been equipped with TV sets, while others had been stimulated to make arrangements with the local TV dealer. More than one hundred answers were returned. Judging from these answers, the programme on the Suez Canal with its integration of several subjects and its inclusion of current events gave the greatest promise for the future use of TV in schools. A programme in English with short scenes was received with enthusiasm as a very good supplement to the teachers' own instruction in English.

As a whole the experiment, which was financially supported by the R.B.E., mainly served the purpose of keeping alive interest in the coming of school television.

In 1958 two committees, under the same chairman, were appointed to investigate educational television. One of the committees dealt with school TV and the other with TV's place in adult education.

The recommendations of the two committees were briefly: Swedish school TV ought to follow French and English patterns in this field. The chief aim would thus be to supplement the teacher. TV has to be an effective means in the hands of the teacher and present to the pupils experts, documents, museums, artists, explorers, and plays which the viewers otherwise would not have a chance to meet. In order to improve the present rather poor situation as regards school films, the committee recommended that telefilms should be produced for sale

after the original programme has been presented on the TV screen. Close collaboration with other countries in Scandinavia can bring down the high costs. Great emphasis was also put on co-operation with the school broadcasting service.

In adult education the recommendation is to establish closer contact between the existing organizations and the Radio of Sweden. This can take place in several ways, e.g. to exchange mutual and early information about plans for the coming season, to adjust the organizations to the changing situation according to the rapid growth of TV in Sweden, to establish local and regional centres for distribution of printed information and pamphlets about TV programmes.

This report was issued in April 1959. The next step will probably be to start a series of pilot programmes as a beginning of a regular TV service for the schools.

Other Media

In addition to the regular school audio-visual aids there are a few initiatives in the field of mass communication which ought to be mentioned. One of the big newspapers in Stockholm arranges a competition every year among pupils. They have to answer questions on an extensive questionnaire, including current events and facts from many different fields. There are two age-levels and accordingly two questionnaires. This competition arouses great interest in schools all over Sweden. The actual competition takes place in school hours, and thus it has official blessing from the school authorities.

The Radio of Sweden has during two seasons arranged series of programmes on the same lines. All grammar schools were invited to appoint a team of three pupils. Through a printed test the sixteen best teams qualified for the radio series. Two-and-two teams met once a week in an evening programme in the general knowledge competition until the final was reached. Besides being very good radio entertainment, these programmes created great interest for scholarly achievement.

Another initiative from the Radio of Sweden was to arrange—in collaboration with R.B.E. and the Board of Vocational Education—a large referendum among the pupils from the seventh school year upwards. The question at issue was the five-day school week. So far the pupils attend school for six days a week. The Yes-side pleaded for a free day per week and tried to convince their fellow-pupils that the school hours of Saturday could be squeezed into the other weekdays. The No-side objected against the hardships of such a short school week. A fully fledged election campaign was organized by the two sides with full support from radio and television and with much publicity in the

newspapers. Many schools from all parts of Sweden took part in the election in the end of April 1959. The No-side won a victory with about 75 per cent of the votes. Most of the practical work in propaganda and the polling procedure was done by pupils. Both the educational authorities and the teachers were unanimous in the positive appreciation of this large scale lesson in civic education.

It can be gathered from this survey that Swedish schools have access to mass communication media of all kinds. This does not mean that the teachers make full and effective use of them everywhere. The most encouraging sign is the great interest that the R.B.E. has shown in the last five years. There is a deliberate effort to train the new generations of teachers to integrate audio-visual aids in their teaching. One way to encourage experienced teachers to learn more about these media was a summer course in 1958, where advisers for each of the twenty-four counties of Sweden were drawn together and received instruction in all fields of audio-visual education. A similar course will be held in 1959. These advisers will help to convince the many lukewarm teachers of the grand opportunities that audio-visual media offer in education.

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Moving Films in Soviet Schools

SOVIET educational science and school practice at all educational levels attach great importance to bringing about both optical and auditory 'visuality' in the process of teaching. Among other mass media of communication which are connected with the modern technological inventions (cinematography, optical and tape recording, reproduction of sound by means of a tape, etc.), sound and silent educational moving films are of the utmost significance.

Nearly thirty years ago there was started in the Soviet Union a broad inculcation of educational films into the practice of school studies. Thanks to the invention of a non-inflammable filmstrip, and later the appearance of a narrow-gauge film projector, there came an opportunity to use moving films in ordinary classroom conditions. By that time began the production of special school moving films devoted to some separate subjects taught at the general school.

Moving Films within the General System of Means of Instruction

The practical possibility of using educational films in the everyday life of the school presented a theoretical problem of how much the introduction of this universal auxiliary means of instruction might supplant the traditional visual aids—drawings on the blackboard, pictures, schemes, etc. Furthermore, was it not possible that the more the technology of the production of moving films and their projection in unshaded classrooms is facilitated and improved, the more films replace the teacher? Might not it be the case that films would relieve the teacher from explaining new material of a subject and from making experiments that involve the use of certain devices, as well as from making excursions to the countryside, industries, etc., for all these things could be done through the use of educational films? One can show on the screen not only what the teacher usually shows either in nature or as models, pictures, and other visual aids; he can also show many things that cannot be displayed with the help of traditional means of presentation. The reading and explaining of new material could be given through the recorded reading by an excellent reader, with words chosen more precisely, perfect in style, and presented in a more expressive and intelligible form than would have been done by an average teacher or even a highly qualified one. Yet, though the idea

of substituting a large number of other visual aids and some very important kinds of teaching activities with educational films seemed to be rather attractive, nevertheless such a tendency was regarded as unreal and not justified scientifically from the basic theoretical viewpoints of Soviet education.

The learning process, which consists of two main parts, is most fruitful and effective only when the many-sided activities of both teacher and pupil are developed to the full. Any didactic means of visuality, i.e. those which are traditional, proved by the experience of centuries as well as by more recent auxiliary means of instruction, including educational films, is justified to the extent to which it helps towards the development of energetic activities of teachers and pupils in the process of learning, thus raising the effectiveness of teaching. Due to the dynamism, emotionality and independence of space and time which enables them to show any objects and phenomena, moving films are indeed very valuable and irreplaceable means of visuality in teaching. But moving films cannot and must not replace other visual aids, because each medium is satisfactory when properly used. Moving films do not exclude, for example, such visual aids as slides and microfilm, despite the fact that evident advantages are on the side of the former. Slides and microfilm present static objects while moving films give them in motion. Nevertheless, in those cases when it is necessary for learning purposes to examine this or that object, see it in detail or copy its outward appearance, or make a description of it—in all such cases wall pictures, slides, and pictures projected on the screen are preferable to moving films. In other cases, when it is necessary to visualize the size of an object, when pupils must not only see it but touch it, hold it in the hands, divide it into separate parts and afterwards assemble it as a whole, when they must make thorough acquaintance with some device and its working, such visual aids as moulage, stuffed animals and birds, models, and the like are best.

But when pupils should see both in motion and natural conditions such objects and phenomena as do not yield to direct observation in life, then a 'magician' comes to the rescue. And this 'magician' is cinematography. Continuously improving methods of filming—rapid, Zeittrafer, microscope filming with enormous magnifications, X-ray filming, filming in special rays that make visible the motion of gases, combined filming, cartoons, etc.—have made it possible to show on the screen in motion the processes which go on in the womb of the earth and in the very depths of the sea, above the clouds, in the microcosm and the macrocosm, and inside the organisms of plants and animals. Thus, in spite of the fact that educational films in Soviet schools are used for teaching purposes more and more as a kind of

visual aid, they have not ousted and do not claim to oust traditional aids such as the word of the teacher, explanation of subject material, instruction, consultation, etc., textbooks, and printed material.

Soviet educational science and school practice attempt to use on a wide scale new means of visuality based on the achievements of the ever-growing modern techniques of radio, film, electronics, etc., and to avoid opposing any new means against such 'old' ones as the word of the teacher, books, illustrations, drawings on the blackboard, and wall pictures. The introduction of new didactic means and methods of teaching does not exclude the older, former things, the latter being partially replaced, especially those which become obsolete and therefore should be replaced. At the same time the traditionally justified didactic means are being modified and improved. New forms of their implementation appear as the result of the introduction of new auxiliary means.

The Soviet schools have worked out in practice certain methods of using educational films. The essence of these methods is that an educational film is organically included into the scheme of a lesson, and is regarded as indissolubly linked and in combination with other means of teaching. The time devoted to, and the significance of, a moving film during the lesson, as well as the means and methods of its presentation to pupils, depend upon the aim of a lesson, upon whether this film will be used as an introduction or as illustrating the explanations of the teacher in conjunction with other visual aids. It is important also whether the content of a film is used as a source of new learning material on the theme of a lesson or for reviewing and summarizing considerable quantities of material studied in previous lessons, for consolidating and extending the knowledge of the material or, lastly, for repetition.

Types of Educational Films

Practical activities of the Soviet school require the use of numerous films of various types for different educational purposes. This is why many different films are being produced to meet the needs of schools.

(1) There are miniature—three to five minutes of demonstration—'film-pieces' and film-loops (narrow filmstrips two to five metres long with the ends stuck together, used for endless demonstration in motion of objects, phenomena, or processes). Both these types of film are intended for display during a lesson in the presentation of some new material or the explanation of it by a teacher. In the above-mentioned cases these 'film-pieces' are the simplest and most available forms of visual aids to be used in the lesson at the most

important moment of the learning process, when the teacher must present new material to his pupils in a vivid and intelligible form, while the pupils must understand and assimilate the material they are given more comprehensively.

Let us take, for example, a few films of such a type.

<i>Curriculum Subject</i>	<i>Name of Film</i>	<i>Notes</i>
Mathematics	<i>Geometrical Spot of the Circumferences Centres of a Given Radius</i>	Used at geometry lessons in 7th form for a visual dynamic demonstration of technological implementations of maths for the construction of toothed spur gearing and roller bearings
Physics	<i>Axis of Cube Symmetry Planes of Cube Symmetry Cutting Cube By Plane Sluices</i>	Used as dynamic visual aids for the theme "Polyhedrons" in 10th form 6th form: 45 metres long, 4 minutes of demonstration; used by teacher as an illustration for the theme "Communicating vessels" and application of this law in life and technology
	<i>Principles of Telephone Work</i>	Used in the study of electromagnets; 55 metres long, 4.5 minutes of demonstration; 7th form
	<i>Echo Sounding</i>	On the theme "Oscillations and Waves"; 9th form; 34 metres long, 3 minutes of demonstration
	<i>Recording of Sound</i>	41 metres; 3.5 minutes
	<i>Ultrasonics</i>	60 metres; 5 minutes
	<i>Ultrasonic Defectoscope</i>	43 metres; 3.5 minutes (The last three films are used to illustrate the theme "Sound" in 10th form)
	<i>Vibro-Hammer Hydraulic Turbine Four-stroke Cycle Engine Change Gears Herz Vibrator Electromagnetic Relay Wilson Chamber Cyclotron Telegraph</i>	} Various brief film-circles
Astronomy	<i>Solar Eclipse Proofs of Earth's Rotation Protuberance Star Parallax</i>	

Curriculum Subject	Name of Film	Notes
Chemistry	<i>Crystallization of Plaster of Paris</i>	
	<i>Crystallization of Salt</i>	
Biology	<i>Growth of Root</i>	73 metres; 6 minutes
	<i>Structure of Cell</i>	50 metres; 4 minutes
	<i>Experiments on Blood Circulation</i>	Two film-pieces: 60 metres; 5 minutes 50 metres; 4 minutes
	<i>Experiments on Vegetative Hybridization</i>	Two film-pieces: 43 metres; 3.5 minutes; 35 metres; 3 minutes

The above-mentioned simple films must always be at the disposal of teachers of mathematics, physics, chemistry, biology, and other subjects, so that they can use them as didactic means just as they always have in their classrooms traditional visual aids and devices to demonstrate at necessary moments. That is why ultra-short educational films are produced and sold on a large scale. Schools buy them at rather low prices, and gradually make collections of film-fragments and the film-circles on different subjects. These ultra-short educational moving films are being produced mostly out of film collection material, sometimes with special filming, including cartoons. (Schools obtain all the other types of educational film on hire from their local education authorities.)

As the practice of schools shows, the introduction of even the simplest film visual aids enlivens the learning process, raises the pupils' interest, and helps towards achieving the most effective results in both the explanation of the new subject material by a teacher and its assimilation by pupils.

(2) Next, there are short 'lesson-thematic' films consisting of one or two reels, that is, from eight or ten up to twenty or twenty-five minutes of demonstration. These films are intended to be used by a teacher in the process of learning a certain theme (part of it, a problem) at the corresponding lesson alongside other didactic means and not for an independent demonstration. Such films vary in their composition, which depends upon their practical use in the lesson.

Sometimes a 'lesson-thematic' film is designed to begin the lesson and is used as an introduction for further study of some given theme with the help of other educational means; an example is the educational film on literature: *Leo Tolstoy's Work Over the Novel 'War and Peace'* (sound film, 120 metres long, 10 minutes showing). This film is shown in the eighth form when pupils are studying that novel. The

film vividly describes the atmosphere amidst which the writer worked on the novel: the "Yasnaya Poliana" Estate, the "Room under the Vaults", the description of the heroes, documents on the Patriotic War of 1812 used by the writer, pictures of battles on the Borodyn Plain (*Borodinskoje Polie*), the Borodyn heroes, and the panorama of the Borodyn Plain.

The ten-minute showing of the film introduces the pupils to the atmosphere of the epoch and events depicted in this classic work, which they have to study within the period of several lessons. At the same time the film presents a vivid description of the writer and his environment at the time of the creation of the novel. All this creates corresponding emotions, arouses interest in, and paves the way for the study of the novel itself and of its literary heroes.

In other cases it is intended that the material of the film will be used by the teacher through the whole lesson, or at two or even three lessons during which the theme is being studied. In those cases the showing of the film is carried out in sections arranged in the order of succession.

Such is, for example, the primary school nature film *The Journey of a Tiny Drop of Water* (239 metres long, 20 minutes showing). It consists of four sections: "Springs and Brooks", "Rivers", "Lakes and Marshes", and "Sea". Each section is used at a corresponding lesson while studying the theme "Water on the Earth" in combination with other visual aids. The film *Newton's Laws* is composed in a similar way (295 metres long, 25 minutes showing). It consists of three parts: "Newton's First Law", "Newton's Second Law", and "Newton's Third Law". Each part is demonstrated in studying the corresponding laws in physics lessons in the eighth form: inertia, relations of the mass of an object and the force applied, the correspondence of action and counter-action. The film show is combined with the demonstration of experiments by means of various devices and with verbal explanations by the teacher.

Finally, films can be shown at the end of lessons in order to consolidate the knowledge gained during a lesson or in a previous one.

(3) 'Theme-review' educational films (in one, two, or three parts) embrace the content of a comparatively large curriculum theme which is being studied in a number of lessons. The purpose of such films is to summarize, systematize, and generalize the whole material of a given theme; they are of great value in recapitulation at the end of a semester or an academic year.

There are such films on quite a number of themes in any subject. For instance, the film *In the Ural Mountains*, which is intended for the introductory course on U.S.S.R. geography, provides a brief review

of nature in the Northern, Middle, and Southern Urals; it shows material which has been studied at a few previous lessons. Another film on literature, *Moscow in Pushkin's Life* (both silent and sound versions, 225 metres long, 19 minutes showing), embraces various periods in the life of Pushkin and is used in the eighth form with the aim of reviewing the poet's works after they have been studied by pupils. There are also theme-review films on history, *Material Remnants of Culture in Ancient Egypt*—and similar films about ancient Greece and ancient Russia—on the great masters of Renaissance art, and on biology, physics, and chemistry.

(4) Educational-documentary film stories and 'film excursions' are intended to show pupils those phenomena in both nature and life which either cannot be seen at all without the help of a film, or involve enormous difficulties in this respect, thus preventing obtaining a concrete impression of them. To this type belong, for instance, most films in school film collections on geography and biology, as well as those which acquaint pupils with different branches of industry and agriculture. Intended for demonstration lessons, these films are also short (not exceeding 30 minutes), and composed so as to provide enough time for discussions and other activities arising from a film show.

During recent years the number of these films has been continuously growing. Here are, for example, some films of this kind: *At the Zoo* (110 metres long, 9 minutes showing) for first and second forms; *The Story of a Small Lump of Sugar* (274 metres long, 24 minutes showing) for the third form; *How They Make Fabrics* (115 metres long, 10 minutes showing)—film-excursions to cotton-fields, spinning and weaving mills; *How They Print Books* (210 metres long, 18 minutes showing)—a film-excursion to a printing works; *How They Make Shoes* (116 metres long, 9 minutes showing)—a film-excursion to a shoe factory; *How They Construct a Building* (120 metres long, 10 minutes showing); *At a Brick Factory* (109 metres long, 9 minutes showing); *At a Modern Automobile Works* (118 metres long, 9 minutes showing); films on physics: *At an Optical Plant* (226 metres long, 20 minutes showing)—a film-excursion while studying the theme "Optical devices" in the tenth form; *Hoisting Devices for Constructional Work* (209 metres long, 17 minutes showing); *Electrolysis and its Use in Technology* (217 metres long, 18 minutes showing); *Power Stations* (314 metres long, 26 minutes showing); films on chemistry: *A City Water-cleansing Station* (118 metres long, 10 minutes showing); *Coke Chemical Production* (228 metres long, 19 minutes showing); *Production of Hydrochloric Acid* (119 metres long, 15 minutes showing); films on biology and basic elements of agricultural production: *Pig-breeding Farm* (116 metres

long, 9 minutes showing); *A Mechanized Cattle-Shed* (234 metres long, 19 minutes showing).

(5) Instructive-educational films are intended to show how to carry out this or that kind of work, this or that kind of motion, how to control this or that mechanism. Such films are used in connexion with the working out of practical habits and skills in pupils in studying such subjects as vocational training, machine elements, domestic science, etc. These films consist either of separate sections or of a series of parts, each being used separately at the proper time.

Such are, for example, the films: *Spring Work in Fields, Gardens and Orchards* (120 metres long, 10 minutes showing); *Cultivation and Fertilization of Soil of a School Garden* (185 metres long, 16 minutes showing); *Cultivation of Soils* (332 metres long, 27 minutes showing); *Cultivation of Field-protecting Forest Belts* (223 metres long, 18 minutes showing); *Treatment of Metal* (232 metres long, 19 minutes showing); *Metal Founding* (275 metres long, 23 minutes showing); *Handling a Turning Lathe* (360 metres long, 30 minutes showing).

(6) Short (in one to two parts) plot-and-game film stories and film narratives of an educational and cognitive nature, such as film aids for lessons of literature aimed at speech development and widening the outlook of pupils in primary classes. Brief film stories on topics ranging from children's and school life to the lives of animals, etc., present interesting material for pupils doing grammatical and other linguistic work, retelling stories, and writing compositions.

Such are, for instance, the films: *Vasja, Pietja and Sharik*¹ (109 metres long, 9 minutes showing); *A Wild Duckling* (108 metres long, 9 minutes showing); *Children—Friends of Birds* (240 metres long, 20 minutes showing); *The Devoted Friend* (114 metres long, 10 minutes showing); films on the theme of treating animals, on children's friendship and group activities: *Be Honest* (113 metres long, 10 minutes showing); *A Find* (106 metres long, 9 minutes showing)—devoted to sincerity and honesty; *It was the Pioneers Who Helped* (117 metres long, 10 minutes showing); *Young Followers of Michurin* (400 metres long, 34 minutes showing); *Love and Respect for Work* (120 metres long, 10 minutes showing)—devoted to the attitude towards work and to the participation of school pupils in socially useful work.

(7) School film-readers (comparatively long films), which include episodes and scenes taken from long feature films on literary and historical topics; filming of literary works and historic events as well as the life, creative work and activities of writers, travellers, and men

¹ "Vasja" and "Pietja" are diminutives, the full names are Vasilji and Piotr respectively; "Sharik" is the name of a dog commonly used by children.

of history. Separate parts and sections from such film-readers are used by the teacher at the corresponding lessons in literature, history, and geography in the senior forms of secondary schools.

A film of such a type is *The Dramatic Works of A. N. Ostrovsky*—a long sound film specially produced for schools (it consists of seven parts and is 750 metres long). The film is composed of parts which show the scenes from various plays of the great Russian classic dramatist relating to different periods of his creative life. The scenes are taken from performances staged by the Moscow Malyj (Small) Academic Theatre, with the participation of famous actors—performers of roles of the classic characters from Ostrovsky's dramas and comedies. Similar to the above-mentioned film is the film *Life and Work of A. P. Chekhov* (four parts, 526 metres long), which contains, besides biographical data, fragments from those stories that have been studied at school as well as some scenes from the writer's best-known plays.

(8) Popular science films (both full-length and short-length) are intended for showing during out-of-class activities, at circles, in giving series of lectures for pupils, in group activities carried out for the purpose of widening the outlook of pupils in both general and polytechnical aspects and for expanding the scope of knowledge received at school. They are also used to satisfy the interests and cultural requirements of pupils in different spheres of knowledge, arts, physical culture, and sports.

(9) A special type of school film (in out-of-school establishments for children) is presented by short-length film stories and feature film narratives on educational topics. They are intended for use in talks and other activities on the problems of social-political, moral, aesthetic, and physical education. The topics of such films usually reflect some essential problems; for example, friendship and comradeship in a children's group, love and respect for work, discipline and proper behaviour at school, in family and in public.

The foregoing list does not exhaust all the varieties of films that are intended for use with children at school and in out-of-school educational establishments. Since school cinematography is continuously developing and more and more used as an auxiliary means in the process of teaching, there appear new varieties of films which must meet new requirements of teachers and pupils. It is necessary to emphasize that standardization is quite intolerable here, for the more varied and differentiated are the films in their content, methodological structure, educational goals and cinematographic arrangements, the wider and better is their application in practical learning and educative activities, and the more they satisfy the requirements of schools.

Pedagogical Claims for Educational Films

There are special pedagogical claims for school films which should be taken into account by cinema studios, scenario writers, and film producers who make this kind of film. The RSFSR Academy of Pedagogical Sciences has carried out special research devoted to this problem. In carrying out this research it thoroughly examined and analysed from pedagogical viewpoints numerous educational films and studied the experience of the use of those films by teachers of different subjects and forms. The Laboratory for School Film of the Research Institute of Teaching Methods produced a number of experimental samples of various types of educational films which were later checked in experimental classes with teachers taking an active part. In the course of work they were modified and improved. The results obtained from this research served as a scientific foundation for pedagogical requirements which should be satisfied with the help of school educational films.

Since it is impossible, within the limits of the present article, to dwell on the problem of pedagogical requirements for different types of school films as well as on the requirements of the films treating this or that separate subject (or group of subjects), we shall enumerate only some of the main general pedagogical requirements which should always be present in any school film.

Primary importance is being attached to the fact that school educational films should be strictly *scientific*. Cognitive material contained by films (concrete data, summaries, conclusions, formulae, laws) must correspond to the modern level of development of the science, the basic elements of which are studied at school. The fulfilment of that most important requirement is provided by highly qualified consultants—scientists and educators who participate in the working out of a methodical script which defines the topic of a film, and who also regularly consult with the scenario-writer and producer in the process of their work on the film.

Every educational film corresponds in its content to the school curriculum on that or this particular subject for a given form. Besides, account is always taken of how many periods the curriculum provides for the study of a given theme and what is the role played by a film in it. This requirement defines the type and didactic task of the film, its length and possible methods of use in a lesson.

An educational film must correspond to the age and the level of mental development of pupils to the extent of their being prepared for perception and understanding of the content of a film. In working out

the content of a film, the scope of interests and conceptions and the psychology of young viewers are always taken into account.

At the same time one should always consider that an educational film is to be used by the teacher and accompanied by necessary explanations on the part of the latter both before and during the demonstration. It is superfluous to accompany the whole content of the film with numerous sub-titles and abundant oral explanations, as all these devices overload the film and prevent pupils from getting a perfect impression of it, thus not facilitating but, on the contrary, hampering the work of the teacher.

In speaking about the correspondence of educational films to age peculiarities and to the level of mental development of pupils it is necessary to stress that age opportunities and the scope of assimilation of material expressed in dynamic film-images greatly increase as compared with books and other verbal means of teaching and moral training. Thus, for instance, older children see with great interest a film intended for little ones, while the latter (and they usually display interest and curiosity for any 'movie') get something from films produced for their older brothers. But, naturally, in both cases there is little practical use. One cannot therefore ignore age ranges in planning the production of educational films.

The order of presentation of visual materials in an educational film is arranged in accordance with a definite, didactically rational cognitive logic and succession: from something which is known to the viewers to the unknown or almost unknown, from simple to complicated, from particular to general (inductively), or, sometimes, when it is possible and necessary, from general to particular (deductively). The content and events of a film must develop in strict succession in time and space. Violations of a cognitive-logical character and dependence on the succession of emotions and aesthetical impressions which are so common in feature and very frequent in popular science films, are intolerable in the case of educational films. The difference between educational and feature and popular science films is similar to that between languages and styles of textbooks on the one hand and *belles-lettres*, periodicals, and popular science literature on the other.

Thus, for example, in most feature, documentary, and popular science films modern technology—machines, operation of separate devices, physical phenomena, chemical transformations, etc.—is presented by camera men in some odd context and from unusual angles, started from a quite unexpected 'middle' and not necessarily finished. This is all done for the purpose of creating quite unusual impressions and emotions in spectators. But when they show a machine in an educational film, then care should be taken first of all about consistency

of acquaintance with the structure of a machine and the principles of its work. First they demonstrate the general outward appearance of the machine (and, if possible, the whole complicated machine and the part of it which is being treated), and afterwards its operation. The device or the mechanism which has to be thoroughly examined is singled out by means of bringing the camera near to the object, filming with a wide angle lense, or by some other method. Then follows the demonstration of the most important details which have to be studied. The motion of mechanisms and their interactions are presented in succession and gradually, with stops whenever it is necessary. The film contains nothing that prevents pupils from focusing their attention on the main object of a given theme.

In other cases it is more rational to observe consistency and succession in the process of presenting visual images in an educational film by means of induction: from particular to general, from elementary to more complicated. Thus, for instance, in order to show pupils how the physics principle concerning the pressure and motion of liquids in communicating vessels is applied in practice, films demonstrate first an elementary method by means of which in ancient times inhabitants of valleys constructed primitive water supply systems, taking advantage of the natural pressure of water in reservoirs on neighbouring hills. After that is shown the artificial raising of water by means of a lift-pump to a water-tower, and the consequent distribution of water to high buildings through pipes. Then follows the description of a water supply system in a big town in all its complexity and up to the level of modern water supply technology.

The requirement of consistency and clearness in the arrangement of visual material in an educational film forbids its being fragmentary and kaleidoscopic, or having, as it is sometimes called, 'short' or 'ragged' filming. On the contrary, visual images in school films should be arranged in a moderate tempo, while the combined pieces of films should be long enough (particularly when the material is comparatively complicated for visual perception) so that not only pupils with a highly developed visual memory are able to assimilate and comprehend every film, but so that all pupils of the same age can understand it as well. That is why it is not only irrational to avoid repeated showings of the same films or episodes but, on the contrary, in most cases such repetition is very useful and even necessary. It is particularly recommended when pupils are being acquainted with such objects and phenomena which cannot be comprehended easily after one viewing, or when for the sake of didactics it is necessary to come back to what has been previously demonstrated in order to understand it in a broader way.

Explanatory notes and sub-titles as well as the words of a narrator are considered to be an important didactic means in school films, for they are intended to facilitate the perception of visual material from the screen by pupils. But in no case may they be a substitute for those things which have to be presented visually. Their task is to explain and summarize what is shown to pupils and only to such a degree as is necessary for a full understanding of the content of the film. In doing this they take into account the fact that the teacher gives the necessary explanations both before and during the demonstration of a film. Therefore not everything (even the complicated and difficult) is explained in educational films with the help of sub-titles and narrators' texts. Sub-titles and texts read by narrators neither exclude nor supplant the explanations given by a teacher; they only help him in his work and serve him with 'marking points' for the explanations which he will give in the course of showing a film.

That is why sub-titles in educational films (even in silent films) as well as the texts read by narrators are reduced to the minimum; they are used only when it is necessary to clarify more important and complicated passages of the film, to divide it into consistent sub-sections and to pass over from one sub-section to the next.

Very often, in order to make moving films 'more vivid', explanatory notes and narrators' texts are cut into several pieces and mixed with passages from the film. It is done thus: they begin a sentence (either in sub-titles or by a narrator's voice) which is suddenly interrupted with dots or by an intonation; a visual 'piece' follows, after which the interrupted sentence is continued. But the idea is not yet completed; there comes again an interval followed by a fresh 'piece' from the film, and so on. These long broken passages of notes and narrators' text, when the subject is separated by a length of film from the predicate, by no means help towards better comprehension of visual images by pupils, but on the contrary, hamper this process.

A written text, as well as that read by the narrator, must be thoroughly thought over, felicitous in style and expressed in a few words.

Organically linked with and alongside a row of visual images is the introduction of natural sound images, which are of great didactic importance. They fill in and widen the perception by pupils of those phenomena, processes and objects which are shown on the screen. We find here noises and sounds: the rustle of leaves, breaking of the sea, howling of the wind, singing of birds, roar of animals, buzzing characteristics of tools, hooting, voices of people, etc. Such a kind of 'sound' arrangement is necessary also in silent films (without a narrator's explanatory text), for verbal explanations are given by a teacher,

while sound images which are organically connected with visual ones must be presented in the film itself. One should use for this sound recordings made for sound films and even film-loops whenever the description of motions demonstrated in the film requires the production of sounds and noises which accompany those motions.

Music in sound films may be justified only when it helps towards better comprehension of a film by pupils, its deeper aesthetical perception, and does not prevent listening to a narrator's voice and his notes as well as to brief explanations made by a teacher. Such kinds of musical accompaniment are not out of place when used moderately; in films for primary classes, or in films on geography, history and literature. In films on the subjects of physics, mathematics and natural science, any musical accompaniment is, as a rule, out of place. It is absolutely intolerable to begin an educational film with a tuneful musical introduction and end it with loud, 'brave' music. Such kinds of film violate a business-like atmosphere in a classroom, not only at a given lesson but at following ones as well.

Extensive title headings which report the names of the scenario-writer, assistants, consultants, stage managers, and producers from pedagogical viewpoints are out of place in educational films. This imitation of films produced for general showing is a foreign element in an educational film. These titles lead to a fruitless loss of time during the demonstration of a film, loss of valuable minutes, and they distract pupils' attention which should be completely focused on the content of a film.

Providing Schools with Apparatus and Films

The introduction of films into schools in the Soviet Union is brought about by means of State planning and State budget allowances effected through administrative bodies of national education. The responsibility for providing schools with projection equipment, screens, and other film devices as well as for supplying schools with film pictures and teacher training is laid upon Ministries of Education in national republics. The latter work out perspective and annual thematical schemes for the production of films, examine scenarios, and invite experts on methodology to participate in the production of films in studios.

The production of school films is being realized by various filming studios on the orders of Ministries of Education. These studios are administered by the U.S.S.R. Ministry of Culture. Also, the Ministry of Education of RSFSR has at its disposal a small film-making studio for school films: "School Film" (*Shkol'film*), which makes educational films mostly from films intended for general screening. These films

are being prepared by re-arranging the film material. They also prepare miniature educational film fragments and film-loops which schools may freely buy.

There are special Subject Expert Commissions in the School Syllabus Department of the RSFSR Ministry of Education composed of highly qualified educationists and experienced teachers specializing in the problems of school visual aids in general and on the problems of educational films in particular. The Commissions consider the main themes of films planned for production and discuss annotations prepared by experts in film libretti as well as literary and producers' scenarios presented by film experts. The Commissions also review those films which are ready and intended for demonstration in schools. The pedagogical recommendations and conclusions made by the Commissions help towards the promotion of creative activities of film experts in the direction of the best application of these films to the practice of school work and in regard to the fullest correspondence of films to school requirements and to the specific conditions of using these films in the learning process.

Films, specially produced for schools on the order and with money supplied by Ministries of Education, are used as visual learning aids and comprise a special Collection of School Films. This collection is controlled by educational authorities which lend films to schools free of charge.

The Collection of School Films consists of hundreds of thousands of film copies on various school subjects for different forms. The following list gives a general impression of the proportions of different films in the Collection of School Films :

FILMS FOR VARIOUS GRADES OF TEACHING AND ON DIFFERENT SUBJECTS

	<i>Percentage in Collection</i>
Films for primary classes	16
Films for secondary and senior classes	84
Films for Russian in primary classes	11.2
Films for natural sciences and geography in primary classes	4.8
Films for lessons on literature	2.8
Films for lessons on history	2.5
Films for lessons on geography	19.2
Films for lessons on mathematics	1.2
Films for lessons on physics	26.4
Films for lessons on astronomy	1.2
Films for lessons on chemistry	4.5
Films for lessons on biology	18.6
Films for lessons on basic elements of industrial and agricultural production	6.4
Films for lessons on physical training	1.2

Not all the school subjects are equally well provided with educational films. Most films are devoted to such subjects as physics, geography, biology, and the subjects of primary training. At the present time, in connexion with the reconstruction of the system of general education and the introduction of a new curriculum and new syllabuses in all subjects, the RSFSR Ministry of Education is carrying out in association with the RSFSR Academy of Pedagogical Sciences a large project devoted to the elaboration of a detailed scheme for complete and systematic filming for all school courses, and to the revision of the School Film Collection so as to make suggestions about further uses of old films in the new circumstances.

At the present time the proportion between silent and sound films in the School Film Collection is two-thirds and one-third respectively. Some of the films have been produced in both silent and sound editions. The proportion of silent to sound films is not stable; it shows a tendency to change in the direction of increasing the number of sound films and a gradual decrease each year in the number of silent films.

The number of films either produced for schools specially or rearranged from films intended for general screening is growing every year; the number of copies turned out for schools has been increased many times. Nevertheless, they have not yet met the demand for educational films made by a gigantic network of schools in the condition of expanding filming of numerous curriculum topics of school teaching. The plan for the development of school filming for the next seven years (1959-65) envisages an increase of the School Film Collection by several hundred per cent, both in the number of titles and size of issues. It is planned to concentrate the production of educational films in a specially equipped film studio capable of very great productivity. This will create the most favourable conditions for inviting highly qualified and experienced workers from educational and cinematographic fields to produce school films. Such a decision will help to promote a fruitful and creative collaboration between educationists and film producers directed on both sides to continuous improvement of the quality of films for schools in educational, cinematographic, and technological areas.

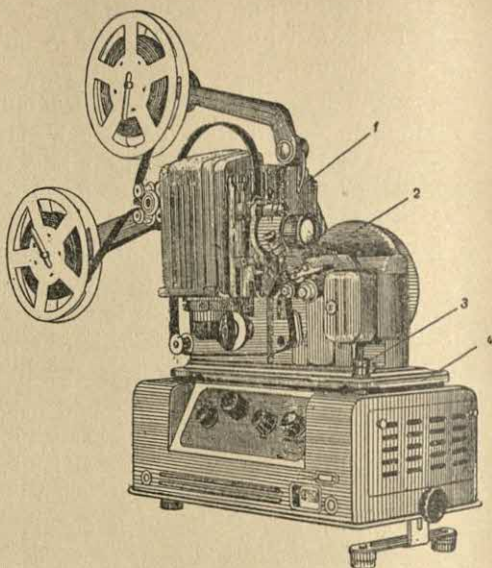
There is a system of providing schools with film equipment and films in the Soviet Union. All Ministries of Education in national republics have boards which deal with the questions of providing schools and other establishments of national education with the necessary articles of school equipment and aids directly on the spot (through the network of specialized shops controlled by the boards). On the orders of these boards the film industries produce for schools special kinds of film

projectors and other necessary articles which are sold on easy-payment terms in GLAVSNABPROS (Chief Board on School Provision) shops to schools only. The construction of school film devices is thus permanently improved. As soon as projectors of new design appear, they are sent to 'film-less' schools, while in other schools the new equipment replaces out-of-date equipment. Recently there was set on foot mass production of a new narrow gauge sound-film projector, *Shkolnik* (school-pupil).

A large number of schools use screens with improved reflection and provided with a device which enables the showing of moving films in an unshaded room. The latter is most convenient for using films at ordinary lessons.

A regular free-of-charge loan of educational films to schools is guaranteed by a special network of film loan centres controlled by educational authorities. They are called *filmotheka* (film collections). Films produced for schools are distributed by the GLAVSNABPROS to *filmothekas* which are attached to local departments of national education. Since each *filmotheka* possesses several copies of every film, it can provide schools in a given locality with necessary films a short time after receiving orders from schools or teachers. Large schools have on their staff a full-time film mechanic who is charged with bringing necessary films from the nearest *filmotheka* and demonstrating them at appropriate lessons on the instructions of a teacher.

A wide popularity is attached to school circles of young film lovers. Pupils of senior forms quickly master the technique of film projection and the proper care of film equipment, and become useful assistants to teachers in showing films both during the lesson and out-of-school



A narrow-strip film-projector PSh-I *Shkolnik* (school-pupil): (1) head of projector; (2) sound block; (3) screw connecting projector and amplifier; (4) base of projector

activities. In recent years enthusiasm for film has spread widely among pupils of secondary schools. In many schools there is amateur filming equipment which is very easy for pupils to master. Starting from filming episodes from the life of their schools, the young film enthusiasts, under the guidance of teachers, master the technique of filming process and the working-up of filmstrips, and then come over gradually to the preparation of self-made short educational films. This has led to the opening of new opportunities in the development of school films.

Concern about the progress of educational films and about their quality is displayed by those directly interested in this matter, i.e. ministries and authorities of education in national republics and the Ministry of Culture of the U.S.S.R., which possesses an all-round control of film production of the whole of the Soviet Union. An important role is also played in this matter by the Soviet educational and cinematographic public. Numerous film sections are successfully operating in professional clubs for teachers and scientific workers: Houses for Teachers and Houses for Scientists. They unite those social educationists and scientists who are interested in the problem of using films for educational and scientific purposes.

Quite recently, on the initiative of the Film Workers Union and the Ministry of Culture of the U.S.S.R., there was held in Moscow the All-Union Conference on Educational Film to discuss important creative and methodological problems of the production of educational films corresponding to the high requirements of our time. Among the participants at the conference were the U.S.S.R. Ministry of Higher Education, Ministries of Education of national republics, and other interested administrative bodies and social organizations. The conference was attended by more than 800 delegates: film and studio managers from all national republics, teachers, scenario writers, teachers of higher educational establishments, methodologists and scientific workers, representatives of the cinematographic, educational and scientific public. The conference also discussed the problems of modernization of the technique of production of educational films, projecting devices as well as devices for showing films in unshaded rooms, since the latter is of great significance for a wide use of films in school.

The decisions and recommendations adopted by the All-Union Conference will undoubtedly play an important role in the further advance of educational film in the U.S.S.R. and in the wide introduction of films into Soviet schools.

A. M. GELMONT.

CHAPTER FOURTEEN

Mass Media and Education in Japan

THE mass communication industry in Japan established itself and developed to its present position virtually without any state support. This growth is more striking when one realizes that other modern industries in Japan have, since the Meiji Restoration in 1868, always developed more or less under the protection and with the assistance of the government.

The Japanese motion-picture industry illustrates the situation best. Those who introduced motion-pictures into Japan and who commercialized them were either show business men who travelled in the provinces or the proprietors of Kabuki plays. Both belong to a type of person representative of the most feudalistic community. The Japanese capitalists of the film industry came from such a group of people. This may well account for the fact that the motion-picture industry, which outwardly looks very modern and Westernized, is really very feudalistic and in many ways rather old fashioned.

Even to-day the capital behind the Japanese film industry is primarily from show-business. Capital from financial and commercial circles has never played an active part. The powerful position of show-business capital is clearly reflected in the chain system of movie houses. To finance production with the present capital, the motion-picture companies have to depend largely upon the income from individual cinemas under the chain system.

Another characteristic of capital investment in motion-pictures is that many investors are involved. Many of the present companies have many thousands of shareholders. The fact that the film industry has developed on such a popular base instead of through the assistance of large capital has implications for certain aspects of production.

The film industry is unable to raise long-term loans because of the weakness of its capital resources; thus production has to be financed from its own capital. It follows, therefore, that the production of Japanese films is a short-term, risky undertaking in which a film is made as quickly as possible and the minimum costs of production have to be recouped within a week of its release. These conditions give rise to a flood of films—some 600 are produced annually.

Naturally such a tendency affects the content of films. While there are some very good feature films intended for export, there are many

cheap and vulgar films for domestic consumption. Both types of motion-picture are being produced at one and the same time.

Radio and television are somewhat different. With the termination of the World War II, the monopoly of broadcasting by a single exclusive corporation (Nipon Hôso Kyôkai, Japan Broadcasting Corporation) was brought to an end. At present there is NHK, on the one hand, which operates under a special law as a national public service corporation to serve the whole nation with stations and other facilities and to broadcast such programmes as will meet the needs of the people, while, on the other hand, there are increasing numbers of commercial broadcasting stations which operate on a profit-making basis. In other words, public service broadcasting and commercial broadcasting exist side by side.

This development is attributed to the belated start of Japan in the field of radio and TV. That is to say, Japan has succeeded in adopting the good points of both Great Britain with its British Broadcasting Corporation, and the United States with its commercial broadcasting system.

NHK is financed by the government and by moneys collected from the general public. Commercial broadcasting is backed by private, commercial, Press, and heavy industry capital, and is financed with the air-time fees and programme production costs paid by sponsors.

Public service broadcasting, which receives moneys from the government, is subject to a certain amount of political control, while commercial broadcasting, which depends upon advertising fees, is not free from the pressure of the economic circles.

Content of Mass Communication

As stated previously, there is a difference between the motion-picture and the broadcasting industries from the economic point of view; but they are similar in their attempts to find wider markets in an excessively competitive system.

It is common to all the post-war mass media in Japan that this intensified competition for markets has given rise to imitation, with the consequent disappearance of individuality. At present, for instance, there are more than forty different weekly magazines, in addition to newspapers, which are virtually the same in composition and content. Usually they have commentaries on current topics, publish interviews with the man of the hour, and include photographic features, reports, book reviews, film reviews, and so on. Imitation means that the same subjects are too often taken up in all these magazines.

In radio and television, too, there seems to be a tendency too readily to imitate whatever programme another station has put on the air if it

was popular with the general public. Frequent examples of this tendency are seen in quiz, popular song, jazz, TV dramatic film, and sporting events programmes. Motion-picture producers are vying with each other in presenting historical films featuring sword-fighting by samurais or the heroic deeds of outlaws, and modern films featuring sentimental mother's love, love affairs, violence or thrilling suspense.

Together with this tendency is a general readiness to flatter the tastes of the masses. Hence there are cries of warning against the danger of "national lunacy".

As for the contents of the modern mass media entertainment programmes in Japan, the underlying theme is an acceptance of the present state of things. At the same time, they seem deliberately intended to prevent any possible resistance on the part of the general public to these ideas by sugar-coating reality. Even in the case of programmes presented independently by the mass media themselves, it is seldom that subjects dealing with the deeply serious problems of society or with fostering attitudes to tackle difficulties under adverse circumstances are taken up. Even when there appears a figure who cannot adjust himself to reality, his maladjustment is explained as caused by some misfortunes in his human relations rather than by the evils of society. The usual solution to such a story is a fatalistic if sorrowful acceptance of the situation. In this way any dissatisfaction is prevented from growing into an organized force.

Mass Communication Audiences

Until the close of the World War II, Japan had been deficient in both classical liberal democracy and modern popular democracy. This represents a very sharp difference between Japan and European and American countries. Only after the war, when Emperor-centred fascism collapsed, can it be said that conditions in Japanese society were favourable to the growth of popular democracy.

Consequently, the statement that the public (or the society of citizens) develops into the mass society, which is quite commonly used to explain developments in Europe and America, is not applicable to Japan. In the history of mass communication, too, the days of 'the public' as used in the sense of the 'good old days' can hardly be said to have developed fully in Japan. For this reason characteristics of mass society, a society of citizens, and even feudalism are mixed together and may even come together to give a peculiar unity in the modes of behaviour and ways of thinking of the present-day Japanese people.

The Japanese attitude towards life is exemplified in the contact people have with media of mass communication. For example, as con-

sumers the general public will not object to the neglect of useful and productive activities because such activities are monotonous and involve painful concentration, and it is from this kind of work that they wish to escape. As far as their immediate aim in life is concerned, it is not with active participation in productive activities but in the enjoyment of leisure and consumer goods. The neglect of productive activities by media of mass communication may be accepted without protest by the general public as consumers. In most cases, they look to motion-pictures, radio, and television for 'entertainment, amusement, and diversion'.

The Development of Audio-visual Education

Although some progressive school teachers and adult education leaders attempted to use film and radio in education on a limited scale as early as the nineteen twenties, it was after the close of the World War II in 1945 that the general and systematic use of audio-visual methods came into school and adult education in Japan.

During the period of occupation by the Allied Powers, Japanese school education underwent a radical change; the educational system was drastically reformed and new methods of teaching based on empirical principles were introduced.¹

In the field of out-of-school education, on the other hand, some 1,300 Nat'co film projectors and many Civil Information and Education (CIE) films (which were later called United States Information Service—USIS—films) were made available to all the forty-six prefectures of the country by the United States Occupation Forces and used mainly for youth and adult education. This measure initiated by the Occupation Authorities within the framework of general policy did a great deal to

¹ The educational significance of audio-visual methods (*Handbook for Use of Audio-Visual Aids*, compiled by Ministry of Education, 1952, p. 9) was stated thus: "Education is an activity for cultivating ability to classify, unite, organize, and utilize experiences. It is therefore important in the activity of education to provide pupils with rich experience. Mere verbal memorization without support of experience will not bring about useful knowledge, nor mere experience yield true knowledge. Rich experience should mean an organic combination of words and experience. Naturally, however, the area that we can normally experience is limited. Besides, the actual world is so complicated that there are many things which are often too difficult for pupils to understand if presented as they are. Audio-visual materials are concrete materials designed to serve as a substitute for direct experience and in which direct experience is presented in such a reorganized way that it is easy for pupils to understand. By the use of audio-visual materials, therefore, it is possible to carry out the primary function of education."

stimulate the establishment of local film libraries and the use of educational films by the groups concerned with out-of-school education.

Audio-visual education in Japan thus depended greatly upon the motivation of foreign countries, more especially the United States. When Japanese sovereignty was restored in 1952 and educational institutions gradually became stabilized, audio-visual education, too, was integrated into the whole system of Japanese education and made sound progress as years went by.

Agencies for Administration and Services in Audio-visual Education

The Ministry of Education as the central agency of educational administration has an Audio-visual Education Section which provides national guidance and services in the field of audio-visual education.

The functions of the section are as follows:

- (1) Films with high educative value (both educational short films and general feature films) are selected and recommended.
- (2) Short educational films are distributed to prefectural film libraries.
- (3) Guidance and advice is offered in the planning and organization of educational programmes on radio and television.
- (4) National seminars or courses designed to improve the use of audio-visual aids by school teachers are organized.
- (5) Guide-books, handbooks, catalogues, and so on, designed as references for teachers are prepared and distributed.

Local education administration is the responsibility of the forty-six prefectural boards of education, under which are set up the city, ward, town, and village boards of education directly responsible for the management and guidance of school and adult education for the various communities.

Teacher-consultant and social education officers in charge of audio-visual education, whose posts are legally established in each prefectural board of education, visit the schools and community centres to provide guidance and advice on the better use of audio-visual aids.

Each prefectural board of education runs its own film library for the loan of films to schools and social education establishments. It also organizes travelling film shows.

Each of the forty-six prefectures has a state-established university with an educational faculty or a college offering two- or four-year courses for intending teachers in the primary and lower secondary schools. These departments offer a course of lectures on audio-visual education and practice in the use of equipment, either as a required or an optional course, so that the students may acquire the minimum ability and skill necessary to use audio-visual aids when they become teachers.

As to the film library, besides those already mentioned, there are some 400 film libraries throughout the country, including those established by town and village authorities. They provide services to schools and social education establishments within their jurisdiction in the form of loans of films and travelling film shows. Several of them, however, face financial difficulties.

TABLE I
FILM LIBRARIES IN JAPAN
(1) Number of Film Libraries

<i>Prefectural</i>	<i>Local</i>	<i>Total</i>
54	354	408

(2) Service

<i>Service for</i>			<i>Service Method</i>		
<i>School</i>	<i>Youth Education</i>	<i>School and Adult Education</i>	<i>Loan</i>	<i>Circuit</i>	<i>Loan and Circuit</i>
118	29	261	147	225	36

(3) Budget in 1957 Fiscal Year

<i>Amount of Budget</i>	<i>Less than 300,000 yen</i>	<i>300,000-500,000 yen</i>	<i>500,000-1,000,000 yen</i>	<i>1,000,000-1,500,000 yen</i>	<i>More than 1,500,000 yen</i>	<i>Total</i>
Number of film libraries	103	146	94	33	32	408

(4) Educational Films possessed by Local Film Libraries (354 in total)

<i>Number of Copies</i>	<i>Less than 20</i>	<i>20-50</i>	<i>50-100</i>	<i>100-150</i>	<i>150-200</i>	<i>200-300</i>	<i>More than 300</i>	<i>Number Unknown</i>
Number of film libraries	81	59	70	25	16	14	8	81

Equipment of Audio-visual Aids at Schools and Community Centres

After World War II the facilities throughout the country both in the schools and in adult education were terribly devastated. As post-

war rehabilitation and reconstruction went on, however, an increasing number of new schools was constructed or fully repaired. More audio-visual materials and aids were also provided as the classroom teachers came to understand the improved methods of teaching.

The following table, which compares the provision of audio-visual equipment between 1953 and 1958, shows how the equipment position improved during these five years.

TABLE II
EQUIPMENT OF AUDIO-VISUAL AIDS

Type of Establishment	Year	Number of Establishments	Number of Audio-visual Aids			
			16-mm. Projector	Recorder	Radio	Television
Primary School	1953	26,555	969 (3.6%)	1,647 (6.2%)	20,340 (76.6%)	10 (0.04%)
	1958	26,964	2,996 (11.1%)	12,895 (48.0%)	24,569 (91.0%)	4,645 (17.2%)
Lower Secondary School	1953	13,685	370 (2.7%)	1,178 (8.6%)	9,500 (69.4%)	2 (0.01%)
	1958	13,392	1,289 (9.6%)	7,626 (57.0%)	13,077 (97.5%)	1,710 (12.8%)
Upper Secondary School	1953	4,572	86 (1.8%)	281 (6.1%)	1,500 (32.8%)	—
	1958	4,586	1,363 (29.7%)	2,268 (49.5%)	2,822 (61.7%)	470 (10.3%)
Community Centres	1953	7,973	558 (7.0%)	480 (6.0%)	817 (10.2%)	—
	1958	26,257	2,150 (8.2%)	2,511 (10.0%)	6,700 (25.5%)	211 (0.8%)

Use of Audio-visual Materials

Films loaned to schools from the prefectural or local film library are shown either with the school's own projector or by means of the travelling film service.

In adult education the use of film depends mainly upon the possibilities of using the travelling film service. As the films made available by the film library are mostly non-feature films, from time to time primary and lower secondary schools in big cities take the pupils to the movie theatre to give them the chance to see excellent feature films.

Research Groups and Organizations

There are a number of national and local research groups and organizations in the field of audio-visual education, each carrying out studies and research in its own field and offering useful information to the people concerned. Among the national organizations are the following :

(1) Academic Society

JAPAN SOCIETY (for the study of radio and TV): (Representative: Misoji Mishimoto. Address: c/o International Christian University, Mitaka-shi, Tokyo).

Membership of the society includes university professors, assistant professors, and other scholarly persons. It conducts studies and research on the educational use of broadcasting and organizes an annual seminar on the important problems in this field.

(2) Organization

JAPAN FILM EDUCATION ASSOCIATION: (Representative: Jiro Arimitsu. Address: No. 26, Sakuragawa-cho, Shiba Nishikubo, Minato-ku, Tokyo).

It conducts studies and research on the use of educational films and publishes a monthly journal, *Audio-Visual Education*.

(3) Study Organization of Teachers

NATIONAL FEDERATION OF SCHOOL AUDIO-VISUAL EDUCATION: (Representative: Toramatsu Suzuki. Address: No. 26, Sakuragawa-cho, Shiba Nishikubo, Minato-ku, Tokyo).

There are forty-five affiliated organizations.

NATIONAL FEDERATION OF BROADCASTING EDUCATION STUDY GROUPS: (Representative: Kyosuke Yamazaki. Address: c/o Kasumigaseki Annex, Japan Broadcasting Corporation, No. 3, Kasumigaseki, Chiyoda-ku, Tokyo).

At its 1958 National Convention, some 4,000 teachers came together from various parts of the country.

NATIONAL FEDERATION OF AUDIO-VISUAL EDUCATION: (Representative: Munetaka Tokugawa. Address: No. 26, Sakuragawa-cho, Shiba Nishikubo, Minato-ku, Tokyo).

These study organizations, with affiliated study groups all over the country, hold regular national and local meetings in an endeavour to promote the development of audio-visual education.

Historical Sketch of Education through Radio and Television

(a) *History of School Broadcasting.* Though the Osaka Central Station of the NHK had been transmitting local school broadcasts since

1933, it was in 1935 that the NHK formally decided to start broadcasting to schools. The service was inaugurated to commemorate the tenth anniversary of the broadcasting service. Later, under the National School Ordinance enacted in 1941, which included a provision that "such types of broadcasts as designated by the Minister of Education may be used for the purpose of instruction at school", school broadcasting was legally recognized.

After a temporary interruption during World War II, school broadcasting was resumed as early as in December 1945, making up for the shortage of textbooks entailed by the ravages of war and, at the same time, contributing greatly to the dissemination of the new methods of instruction.

The present school broadcasting service of the NHK offers to primary, lower, and upper secondary schools throughout the country programmes which amount to three and a half hours a day and fifty-three subjects a week.

Besides school broadcasting by the NHK, other types of school broadcasting developed after the World War II. For instance, daily school broadcasts are produced and put on the air by the Municipal Board of Education of Nagaoka City through FM transmitters, and by the Municipal Board of Education of Nagoya City in collaboration with a commercial radio station of the region.

As to school television, it was formally started by the NHK in February 1953. The NHK had, incidentally, sent out experimental TV transmissions in October 1951 for the first time in Japan.

Later, with the opening of the NHK Educational Television channel in 1958, school telecasts came to be put on the air over both the previously existing channel of the NHK General Television and the newly started channel of the NHK Educational Television. The present telecasting time amounts to two hours and ten minutes a day and provides twenty-four subject programmes a week.

(b) *Utilization of School Broadcasting.* Educational broadcasting in Japan was pushed forward as part of the cultural movement for children by teachers and scholars who were not satisfied with the school curriculum fixed by the government. In other words, an organized and intimate group of progressive teachers who were not content with the state-compiled textbooks and who attempted to bring broader and more flexible materials into school was the main force behind the use of school broadcasting. However, the efforts of these progressive teachers did not bear much fruit.

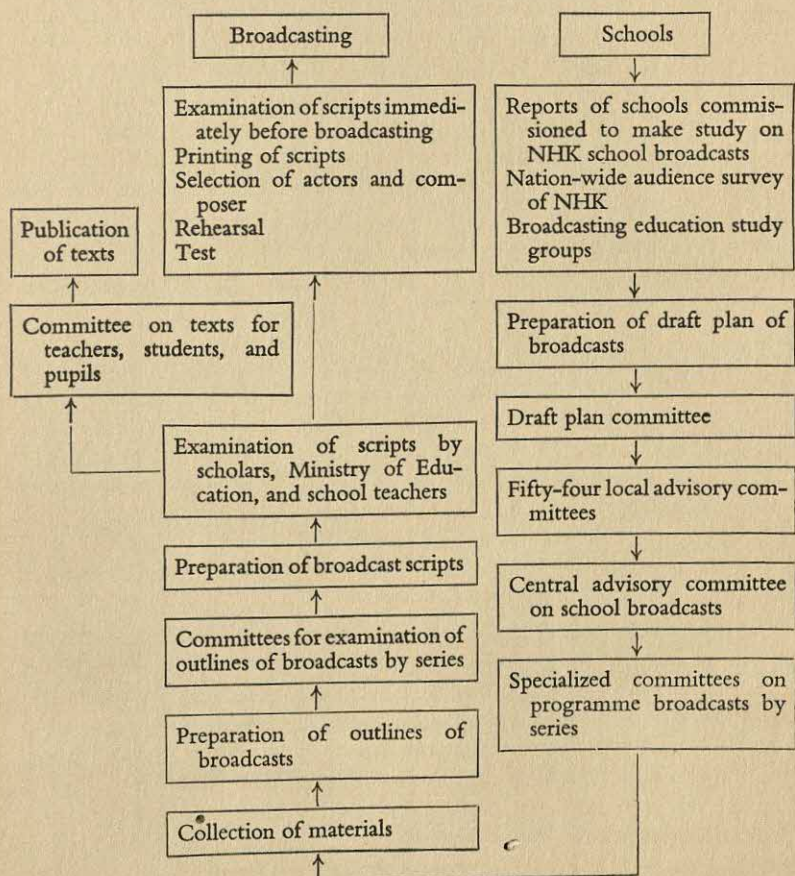
After the war the situation was completely changed. The decentralization of educational control became a reality; initiative on the part of school teachers was highly prized; studies of new teaching methods were

vigorously pursued; and, amongst others, the principles of audio-visual methods came to be greatly valued. When commercial broadcasting services were introduced, on the other hand, scholars, teachers, and parents were very anxious to protect children from the bad influences of mass media. Consequently, the importance of educational broadcasts has come to be recognized in ever-increasing degree.

The Present Broadcasting Programmes to Schools

(a) *Preparation of Programmes.* School broadcasts put on the air by

TABLE III
PROGRAMME PROCEDURE



the NHK to-day are produced after a year and a half of work. In the preparation of programmes, the NHK adopts what may be called a piling-up formula. The desires and opinions of teachers engaged in actual teaching are given first consideration in producing the best-suited school programmes. For this purpose, NHK's survey and research agencies and various specialized committees are fully mobilized. Programme preparation procedure is shown in Table III.

(b) *Time-table, Length, and Subject-matter of Broadcasts.* Over its nation-wide network, NHK is serving schools all over the country by offering such school broadcasts as shown in Tables IV, V, VI, VII, and VIII.

TABLE IV
RADIO BROADCASTS TO PRIMARY SCHOOLS

School	Subjects	Lower Grades (10.00-10.15 a.m.)		Middle Grades (10.15-10.30 a.m.)		Upper Grades (10.30-10.45 a.m.)	
		1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Primary School	Language	Radio Class in Language*	Ditto*	Ditto*	Ditto**	Ditto**	Ditto**
		Play with Language		Library for all of us		Radio Library	
	Music	Radio Class in Music*	Ditto*	Ditto*	Ditto**	Ditto**	Ditto**
		A Bag of Songs		Happy with Music		Travels in Music	
	Social Studies	Picture Diary of 'Kenchan'		That Village and this Town What Happened There?		Travels with Mike Old Times of Japan Current Topics	
	Science	Expedition of 'Kenchan'		Expanding Science Room		—	
	Morals	The Kitten 'Mee'		An Intimate Group		Happy School	

- REMARKS: (1) Those with the mark * are broadcast from 9.15 to 9.30 a.m.
 (2) Those with the mark ** are broadcast from 9.30 to 9.45 a.m.
 (3) Those without asterisks, for the middle grades and the upper grades, are re-broadcast from 11.00 to 11.15 a.m. and from 11.15 to 11.30 a.m. respectively.

TABLE V

RADIO BROADCASTS TO LOWER AND UPPER SECONDARY SCHOOLS

School	Time-table	Language	Social Studies	Science	Music	English	Vocation and Home-making	Morals
Lower Secondary School	9.45- 10.00 a.m.	Language	History Geography	Science	Music	—	Vocation and Home-making	—
	10.45- 11.00 a.m. Re-broadcast 11.30- 11.45 a.m.	Meet the Masterpieces of Literature	World To-day	Window of Science	Listen to Masterpieces of Music	—	—	Diary of 'Tatsuo' Personalities in History
	1.00- 1.15 p.m.	—	—	—	—	Radio English Class: (Elementary, Middle, Upper)	—	—
Upper Secondary School	11.45- 12.00 a.m.	Japanese Classics	Current Topics	Science of To-day	Library of Masterpieces	Study of English Language	—	Inquiry into Adolescence

(c) *Texts of School Broadcasts.* In order that school broadcasts may be utilized systematically and effectively, the contents of broadcasts are examined in advance by the teachers who will use them. To assist them the NHK produces and publishes the printed guides for the teachers and students respectively for each of the three school terms.

Actual Use of School Broadcasts

(a) *Actual Use as Found Out by Surveys.* According to the nationwide survey conducted in 1958 by the Broadcasting Culture Research Institute of the NHK, the percentages of schools equipped with radio receiving sets were as follows:

Primary	. . . . .	95 per cent
Lower Secondary	. . . . .	95 per cent
Upper Secondary	. . . . .	94 per cent

Of these, the percentages of schools using broadcasts regularly were as follows:

TABLE VI
TELECASTS TO SCHOOLS

Subjects	Primary School			Lower Secondary School	Kindergarten or Nursery
	Lower Grades	Middle Grades	Upper Grades		
	11.00-11.15 a.m.	11.35-11.55 a.m.	11.35-11.55 a.m.		
Mathematics and Language	Number and Words	—	—	Exploring the Masterpieces*	Let's Play Together
Science	Why Is It So?	Notes of Observation	Our Experiment Room	Notes on Science*	
Social Studies	Growing Child	Our Livelihood	Travel in TV History of Life TV Excursion *	World and Japan* TV Excursion*	
Art and Music	—	Pleasant Classroom	—	Window of Arts* (fine arts and music)	Puppet Show
English	—	—	—	English Classroom*	Let's Join Hand in Hand
Health and Physical Education	—	—	—	Health and Physical Education*	
Vocation and Home-making	—	—	—	Vocation and Home-making*	

REMARKS: (1) Those with an asterisk are re-broadcast on the following day from 11.15 to 11.35 a.m.
 (2) The Chart shows only those broadcast over the channel of NHK General Television. Besides, NHK Educational Television offers re-broadcasts of those for the middle and upper grades of primary school from 10.00 to 11.20 a.m., and 'Classroom in Science' for the upper grades of the primary school, and for the lower and upper secondary schools.

Primary	42 per cent
Lower Secondary	37 per cent
Upper Secondary	22 per cent

As regards television, although it is only six and a half years since telecasting to schools was started, the number of schools equipped with TV receiving-sets has risen to some fifteen thousand throughout the country, and of the schools with sets, 93 per cent of primary schools and 68 per cent of lower secondary schools utilize school telecasts.

In 1955, to commemorate the twentieth anniversary of the inauguration of the broadcasting service, NHK launched a five-year plan to donate transistor radio receiving-sets to schools in the remote non-electrified areas of the country. By 1959 the project was completed, so

TABLE VII

TEXTS OF RADIO BROADCASTS TO SCHOOLS

School	Publication for use of		Frequency of Publication per Year	Number of Copies per Publication	Number of Pages per Copy	Remarks
Primary School	Teacher	Lower Grades	3	31,000	76	
		Middle Grades	3	31,000	76	
		Upper Grades	3	33,000	76	
	Pupils	Lower Grades	3	30,000	27	
		Upper Grades	3	75,000	39	
Teachers			3	18,000	96	
Lower Secondary School	Pupils	Radio Class in English (Elementary)	3	28,000	32	
		Radio Class in English (Middle)	3	25,000	32	
		Radio Class in English (Advanced)	3	10,000	32	
		Teachers and pupils alike		3	17,000	56

TABLE VIII

TEXTS OF TELECASTS TO SCHOOLS

<i>Publication for use of</i>		<i>Frequency of Publication per Year</i>	<i>Number of Copies per Publication</i>	<i>Number of Pages per Copy</i>	<i>Remarks</i>
Primary School Kindergarten Nursery	Teachers	3	22,000	62	
Lower Secondary School	Teachers	3	10,000	56	

that even out-of-the-way schools not yet equipped with electricity are able to use school broadcasts.

(b) *Main Problems to be Solved and Future Prospects.* As previously

mentioned, nearly half of the 24,000 primary schools in the country, for instance, are using school broadcasts with a consequent improvement in teaching. The nation-wide achievement tests conducted by the Ministry of Education in 1958 indicate that schools using school broadcasts obtain higher marks than others. Nevertheless, many schools are still reluctant to use school broadcasts. Others stop using them during the course. The following reasons for not using school broadcasts have been discovered.

(1) Because the times of broadcasts are fixed, it is difficult to integrate them into the school time-table.

(2) So much time is spent on other types of instruction that there is not enough time for school broadcasts.

(3) The content of school instruction does not always coincide with that of school broadcasting.

(4) Reception is not always good.

(5) Sufficient knowledge about broadcasts cannot be obtained far enough in advance.

These problems can be solved to some extent by making more receiving-sets available, improving on understanding of the principles of audio-visual education, and disseminating improved printed guides for teachers. An annual survey on the use of school broadcasts indicates a gradual increase in the percentage of the schools using them.

Educational Use of Film

The present educational use of film in Japan may be described roughly under the following three heads.

(1) Commercial films showing at movie theatres have a great influence upon young people. In the case of such films an attempt is made to intensify their good and to check their bad influences. An example of these attempts is the so-called 'Movie Viewing Class', in which pupils are taken to movie theatres in groups under the control of teachers.

(2) Educational and cultural short films are used as supplementary cultural materials either in or out of school. The usual method takes the form of a film show.

(3) Films as a tool of instruction are used in accordance with a general educational plan. The use of special technical films both in and out of school comes under this category.

The prototypes for the educational use of film may be found as early as 1896, when motion-pictures were first introduced into Japan. With the passage of some sixty years, its educational use has gradually been established.

In 1897, when a motion-picture was shown for the first time to the general public, it was publicized with the catch-phrase, "the greatest material for education to broaden the knowledge and experience of human beings". A meeting of 'Motion-picture-showing for Education' was organized in 1901 for the benefit of adults. While movie theatres began to be established in 1903, there developed in 1908 a non-theatrical form, that is, travelling films shown for the purpose of education, information, and public relations. In 1911, when a French detective film *Gigoma* was presented at movie theatres with an increasingly apparent harmful influence upon the younger generations, public opinion favoured the introduction of certain measures to provide educational guidance to the movie industry.

There were two trends in public opinion. One demanded measures to limit the number of viewers, prohibit showing, and urged the control, authorization and examination of films by competent authorities. This demand was raised by conservatives who respected traditional cultures and authorities. Others demanded a progressive trend towards the use of films for educational purposes. They wished to foster the production of good films. The groups of teachers and producers who supported the second movement had repeatedly to fight against oppression and social prejudices. They laid the foundations on which educational films were produced and used in competition with commercial films produced to meet consumer tastes. Among educational and short films in Japan are included non-commercial dramatic films for children, cultural and scientific films for use both in and out of school, and films providing material useful in teaching.

The educational use of film developed rapidly after 1920, when portable 35-mm. movie projectors were imported from the United States, and later when 16-mm. projectors became widely used after 1928. Teaching films were also imported from the United States and Germany. About the same period, the planned production of films intended for use in the teaching of science, geography, and so on, was started in the country. Dramatic films, which made up the main programme of the travelling film shows for children, were also actively produced. On the other hand, the systematic non-commercial use of film by educational circles progressed steadily and gave rise to an increased demand for such educational films.

Later, the ultra-nationalistic control of thought, culture, and education, which led the nation into World War II, greatly affected the content of such films. In 1939, when the Motion Picture Law was passed, educational films were legally protected economically, but in exchange they came under the government's censorship. This was in order to serve the purposes of war.

When the war came to an end in 1945, the facilities of schools and other educational institutions equipped with 16-mm. projectors had been largely destroyed by air-raids. Furthermore, the war-time legal protection against commercial competition was completely removed, consequently it was almost impossible to attempt to resume film production.

All that remained were the comradeship of the documentalists (which had been fostered through the resistance struggles) and a few movie theatres which had survived the ravages of war. These spiritual and material factors were the source of a new educational film movement immediately after the war. It had the support of the post-war educational and cultural reformers who were vigorously carrying out a drastic democratization of the country. The movement used the remaining movie theatres to show pupils democratic and healthy dramatic films as well as the usual educational and cultural films. Six million pupils and students had to be mobilized. This number was the minimum required in order to produce such films out of pupil contributions. The movement made an effort to secure this number of pupils, but as at that time people were obliged to live frugally and had at the same time to contribute to the reconstruction of schools, they could barely afford to pay for their children to see films regularly. Thus, the major companies producing such films went bankrupt one after the other, because they were unable to collect enough money.

In 1948 a movement to use films in adult education developed. Thirteen hundred 16-mm. talkie projectors were made available by the U.S. Occupation Authorities for the democratic education of adults. Thanks to the new prevailing educational principles, this movement gained wide support as far as its idea and objectives were concerned, but it could not consolidate economically the production of educational films.

Meanwhile, industrial circles initiated the production of public relations films as a new means of propaganda. As the demand for such films increased, the Japanese documentalists looked to them for financial support. For a time, they managed to produce educational films by using the intervals in the production of public relations films for the purpose or by preparing films which would serve an educational purpose at the same time.

In 1949 the prospect of producing in a more planned manner educational films (which had been made on a very small scale under difficult circumstances by the various companies) became possible through the organization of a co-operative society. Of the forty-three producing companies then in existence, ten companies formed a co-operative

association to produce in turn films for instruction in the social studies—the central subject of the new education.

This planned production of educational films for school instruction was supported by some forty-seven film libraries which were emerging through the existence of the 1,300 projectors loaned by the U.S. Occupation Authorities, the 800 projectors owned by schools, and the 1,300 projectors owned by other institutions. The total number of projectors amounted to 3,400.

Under this co-operative system, fifteen titles on twenty-seven reels were turned out in the course of a year or so, and the greatest number of copies sold in one year was 125. Since the plan depended upon the recovery of production costs by the sale within six months of a hundred two-reel copies of each title, the companies faced difficulties which necessitated a further rationalization of the production system. Most of the small-scale educational film-producing companies turned to 16-mm. techniques. Moreover, the teaching films produced by the Encyclopaedia Britannica Films, Inc. in U.S.A. and the Gaumont British Films, Inc. (now Rank Precision Industries, Ltd.) had been introduced about the same time, and their technical qualities encouraged the production of one-reel ten-minute teaching films. Consequently, the quality of Japanese films for teaching was improved remarkably, and production was rationalized to such an extent that production costs could be recovered by the sale of sixty to seventy copies of a title.

On the other hand, the production of dramatic films for children, which had been suspended after the production of ten or so titles because of the financial difficulties already mentioned, was resumed in 1954 as the movement to establish film libraries of teaching films spread considerably. But the main market for such films moved from the commercial movie theatres to the non-commercial film shows for schools and adult education audiences. *Trumpet Boy*, one of several detective films produced for these purposes, won a prize at the Edinburgh Film Festival in 1957.

After 1952 the post-war educational film industry was gradually able to support itself without financial assistance from the government. This independence came as the result of constant and concentrated efforts to promote the setting up of film libraries all over the country with a view to building up a market for these films.

Partly because small, convenient projectors were made available at lower prices, the number of projector owners rose; while the number of 16-mm. sound projectors owned by schools had been virtually nil in 1945, by 1953 3.6 per cent of the primary schools, 2.7 per cent of the lower secondary schools, and 1.8 per cent of the upper secondary

schools owned one. These percentages increased to 11.1 per cent, 9.6 per cent, and 26.3 per cent respectively by 1958. As to the adult education establishments, ownership of projectors also increased remarkably under the stimulus provided by the loaned projectors. The number of projectors used by large industries for marketing, production control, and technological uses rose sharply. The present demand for projectors is so large that the domestic output, calculated at some 3,500 in 1958, cannot meet it.

By 1952 local film libraries had reached the stage of purchasing films with grants from local educational authorities and regular contributions from parents and pupils. These sources of income made possible the gradually increasing production of educational films.

By way of summary, below some statistical tables are given. Table IX gives a general picture of production, while Table X classifies the films produced since 1952 by their intended uses. Table XI gives figures of the films put on the market for non-commercial use. Table XII shows the distribution of producers in 1958. In Table XII the percentage of films produced in 1958 by the educational film-producing companies is shown as 32.3 per cent. The following figures reveal the rise in the upward curve of this percentage since 1952: 49 titles, 16.1 per cent in 1952; 46 titles, 12.4 per cent in 1953; 52 titles, 11.7 per cent in 1954; 70 titles, 14.8 per cent in 1955; 150 titles, 22.2 per cent in 1956; and 157 titles, 22.8 per cent in 1957.

TABLE IX
PRODUCTION

Year	Number of Producers	Number of Titles	Number of Reels
1945-7	14	84	142
1947	27	125	217
1948	47	171	253
1949	43	209	399
1950	46	231	471
1951	64	233	448
1952	83	304	608
1953	105	372	756
1954	111	445	929
1955	135	473	1,020
1956	185	676	1,531
1957	182	688	1,622
1958	193	768	1,794

TABLE X
PRODUCTION CLASSIFIED ACCORDING TO USE

Year	Films for Instruction		Films for Movie Theatres		P.R. Films and Others	
	Titles	Reels	Titles	Reels	Titles	Reels
1952	102 8 (33·6)	215 10 (35·4)	5 1 (1·6)	16 2 (2·6)	197 16 (64·8)	377 29 (62·0)
1953	95 7 (25·5)	203 13 (26·9)	6 1 (1·6)	22 2 (2·9)	271 20 (72·9)	531 45 (70·2)
1954	133 6 (29·9)	291 8 (31·3)	4 1 (0·9)	15 7 (1·6)	308 68 (69·2)	623 156 (67·1)
1955	163 13 (34·5)	385 25 (37·7)	5 2 (1·1)	18 7 (1·8)	305 75 (64·4)	617 162 (60·5)
1956	253 14 (37·4)	588 33 (38·4)	8 5 (1·2)	45 29 (2·9)	415 169 (61·4)	898 383 (58·7)
1957	245 18 (35·6)	580 43 (35·8)	19 9 (2·8)	107 55 (6·6)	424 189 (61·6)	935 461 (57·6)
1958	327 37 (42·6)	726 87 (40·5)	24 15 (3·1)	174 120 (9·7)	417 214 (54·3)	894 476 (49·8)

NOTES: The figures in italics indicate the number of coloured films in all or in part.
The figures in parentheses shows the percentages of the total output of the year.

TABLE XI
NON-COMMERCIAL FILMS

Year	Total Output	Number of 35-mm. Films on the Market	Percentage	Total Output	Number of 16-mm. Films on the Market	Percentage
1952	304	127	41·8	608	276	45·7
1953	372	133	35·8	756	296	39·2
1954	445	189	42·5	929	407	43·8
1955	473	188	39·7	1,020	432	42·4
1956	676	279	41·3	1,531	639	41·7
1957	688	293	42·6	1,622	687	42·4
1958	768	343	44·7	1,794	768	42·8

NOTE: The percentage is to the total output of the year.

TABLE XII
PRODUCERS OF FILMS

Producers	Total Output		16-mm. Film		Coloured Film	
	Titles	Reels	Titles	Reels	Titles	Reels
Central Government Agencies	53 (6.9)	138 (7.6)	17 (2.2)	34 (1.9)	24 (31.0)	72 (4.0)
Public Corporations, etc.	16 (2.1)	42 (2.3)	9 (1.2)	20 (1.1)	6 (0.8)	13 (0.7)
Local Government Agencies	83 (10.8)	157 (8.8)	35 (4.6)	69 (3.8)	26 (3.4)	71 (4.0)
Schools, Research Institutes	9 (1.2)	23 (1.3)	8 (1.0)	20 (1.1)	5 (0.7)	14 (0.8)
Oversea Diplomatic Missions	2 (0.3)	7 (0.4)	—	—	—	—
Commercial Films	250 (32.4)	526 (29.3)	108 (14.1)	236 (13.2)	151 (19.7)	332 (18.5)
Private Associations, etc.	81 (10.5)	200 (11.1)	30 (3.9)	65 (3.6)	30 (3.9)	71 (4.0)
Educational Film-producing and Distributing Companies	248 (32.3)	558 (31.1)	162 (21.1)	259 (14.4)	10 (1.3)	22 (1.2)
Educational Film and Dramatic Film- producing and Distributing Companies	26 (3.4)	150 (8.4)	—	—	14 (1.8)	105 (5.7)

NOTE: The percentage is to the total output. TV films are excluded.

The production of 16-mm. films is shown in Table XIII, while the production of coloured films is given in Table XIV.

Lastly, figures of film production arranged according to the uses in school teaching and in adult education are provided in Table XV, while some data on the production of dramatic films for children and animated cartoons are given in Table XVI.

TABLE XIII
PRODUCTION OF 16-MM. FILMS

Year	Titles	Percentage	Index	Reels	Percentage	Index
1952	56	18.4	100.0	99	16.3	100.0
1953	107	28.8	191.0	187	24.7	188.9
1954	124	27.9	221.5	237	25.5	239.4
1955	168	35.5	300.0	340	33.3	343.4
1956	286	42.3	510.7	537	35.1	542.4
1957	326	47.3	582.1	637	39.3	643.4
1958	369	48.0	658.9	703	39.2	710.1

NOTE: The percentage is to the total output of the year. TV films are excluded.

TABLE XIV
PRODUCTION OF COLOURED FILMS

Year	Titles	Percentage	Index	Reels	Percentage	Index
1952	20	6.6	100.0	30	4.9	100.0
1953	25	7.0	125.0	53	7.0	176.7
1954	75	16.0	355.0	171	18.4	570.0
1955	89	18.0	425.0	193	18.9	643.3
1956	188	25.9	875.0	445	29.1	1,483.3
1957	202	29.4	1,010.0	498	30.7	1,660.0
1958	255	33.2	1,275.0	536	63.4	2,176.7

NOTES: The percentage is to the total output of the year. TV films are excluded. Partially coloured films are also excluded.

TABLE XV
TEACHING FILMS

Year	For School Teaching						For Social Education					
	Title	Per-cent	Index	Reels	Per-cent	Index	Title	Per-cent	Index	Reels	Per-cent	Index
1952	17	5.6	100.0	28	4.6	100.0	7	2.3	100.0	12	1.9	100.0
1953	13	3.5	76.5	19	2.5	67.9	8	2.2	114.3	15	1.9	125.0
1954	24	5.4	141.2	30	3.2	107.1	5	1.1	71.5	11	1.2	91.7
1955	30	6.3	176.5	39	3.8	139.3	21	4.4	300.0	50	4.9	416.7
1956	85	11.1	500.0	120	7.8	428.6	24	3.6	342.9	54	3.5	450.0
1957	96	14.0	564.7	134	8.3	478.6	27	3.9	385.7	66	4.1	550.0
1958	111	14.4	652.9	154	8.6	550.0	51	6.7	728.6	126	7.0	1,050.0

TABLE XVI
DRAMATIC FILMS AND CARTOONS

Year	Dramatic Films for Children						Animated Cartoons					
	Title	Per-cent	Index	Reels	Per-cent	Index	Title	Per-cent	Index	Reels	Per-cent	Index
1952	7	2.3	100.0	27	4.4	100.0	15	4.9	100.0	23	3.8	100.0
1953	4	1.1	57.1	19	1.2	70.4	11	3.0	73.3	20	2.6	87.0
1954	7	1.6	100.0	21	2.3	77.8	15	3.4	100.0	19	2.0	82.6
1955	13	2.7	185.7	60	5.9	222.2	7	1.5	46.7	14	1.4	60.9
1956	40	5.9	571.4	190	12.4	703.7	13	1.9	86.7	21	1.4	91.3
1957	40	8.8	571.4	190	14.0	703.7	12	1.7	80.0	18	1.1	78.3
1958	34	4.4	485.7	172	9.6	637.0	31	4.1	206.7	50	2.8	217.4

ACKNOWLEDGMENT: All these tables are based on the survey conducted by the Japan Film Education Association, Inc.

Evidently, the production of educational and short films in Japan is now fully fledged with the increasing number of film libraries as the main market. In other words, most educational film producers in co-operation with teachers and educationists have been striving to find their own market. At the same time they have accepted orders for public relations films in order to make their business economically sound. This development has not been without difficulties, but now at last it seems to have reached a successful stage.

In spite of this apparent success, however, the future is not entirely bright. The appearance of television in 1953 and its subsequent rapid development, and the recent investment of a huge amount of capital in the educational film industry (induced by the possibilities of there being a fruitful market), are raising new problems and challenges. It must, therefore, be said that the position of the educational and short film industry, now thirteen years old, is not yet entirely stabilized.

Television

In spite of the fact that there are only about 2,000,000 television sets in Japan—a figure representing one-sixth of the radio sets in use—and even these are concentrated in the big cities, television has been greeted with such enthusiasm as to bring about the so-called 'Television Age' or 'Television Boom'. This phenomenon constitutes a real threat to mass media like Press, radio, and film. The estimated increase in TV receivers during the year 1959 is calculated at 1,500,000—only seven years after the NHK (Japan Broadcasting Corporation) was licensed to start regular broadcasts. In television it is true that Japan was behind certain countries in Europe and America. This late start enabled her to benefit from the experience of these countries by adopting their successful experiences and avoiding their failures.

For instance, in the United States the newly added VHF channels were reserved for non-commercial, educational purposes, with the result that the audience for educational television has not increased as much as was expected. In view of this failure, Japan assigned the VHF channels for educational purposes in the following three ways.

(1) A channel in the VHF range was assigned as the second channel of the NHK (non-commercial educational television).

(2) Exclusively educational stations by private enterprise were licensed to use channels in the VHF bands.

(3) Privately owned 'semi-educational stations', which are required to devote more than 30 per cent of the total programme output to educational telecasts, were licensed to use channels in the VHF bands.

It remains to be seen whether such measures will bring about the expected results.

Telecasting Services

The highest organ of the NHK, as a public-service corporation, is the Management Commission which decides matters of policy. The Commission is composed of eight members, each selected from the eight regions of the country, plus the President of the NHK. The eight members are appointed by the Prime Minister with the approval of the National Diet, while the President of NHK is appointed by the Management Commission. The Commission is responsible for all policy matters, including the preparation of a budget of revenue and expenditure, the settlement of accounts, the programme of activities, the method of financing, the plan for the organization of departments, the basic plan for programme preparation, and so on. In addition, the annual programme, budget and method of financing must be approved by the Minister of Postal Services and Communications after reference to the Radio Waves Control Commission.

Such being the relations of the NHK to the government, there is no direct interference of the latter as far as programming is concerned, but it is possible that a certain amount of control may be exercised through the manipulation of personnel and the budget. Such forms of control may constitute an obstacle to the freedom of telecasting. In other words, the fact that the members of the Commission are appointed by the Prime Minister with the approval of the National Diet (that means with the approval of the party in power), might give rise to a situation where the provisions in Article II—2 of the Broadcasting Law—"to ensure the freedom of expression in broadcasting by guaranteeing the non-partisanship, truth, and autonomy of broadcasting activity"—might be contravened.

Commercial telecasting services are basically different from those of the NHK in that they follow the usual joint stock system of management. The top management is the board of directors, which is responsible for deciding upon the policies of operation and ensuring the overall, efficient operation of stations. The board of directors consists of more than three persons and more than one auditor. These posts are in most cases occupied by men who are directors of other types of business. One characteristic of the commercial telecasting services in Japan is that by far the greater portion of their capital stock is owned by the Press, bank, and heavy industry. This extent of Press capital is possible because the major Japanese newspapers are financially powerful, each having a daily circulation of several millions.

Needless to say, commercial telecasting services depend upon advertising fees paid by programme sponsors. Since sponsors are

vitality necessary, it is natural that commercial broadcasters should make every possible effort to secure sponsors to maintain their enterprise and to make the maximum possible profit. The sponsors have an increasingly strong say in programming. In spite of all the efforts of the staff, it is thus becoming increasingly difficult for commercial stations to remain consistent in their programme planning. The production of many more light entertainment programmes than is desirable is one result. This influence also accounts for the lowering of programme content in order to reach the maximum possible audience.

Of the sponsors of commercial telecasts classified by the type of business engaged in, manufacturers of machines and instruments come first, medicine manufacturers come next. Manufacturers of toilet goods, soap, food, and dairy products follow in that order.

Clearly, from this list of leading sponsors, the firms supplying popular consumers' goods form the large majority of the sponsors.

Contents of Telecasts

As already stated, there are many differences between public and commercial broadcasting as far as finance, management, and operation are concerned. As for programme planning, both are required by the Broadcasting Law (1959) to conform with certain criteria.

The broadcasts of each station are roughly classified into four groups: (1) educational programmes, (2) cultural programmes, (3) news programmes, and (4) general entertainment programmes.

The percentages of time taken up by each of these groups differ for commercial TV stations, educational TV stations, and general TV stations. A licence is not granted to educational TV stations unless air-time devoted to educational programmes each week is over 50 per cent and that to cultural programmes over 30 per cent of the total air-time. For general TV stations, it is required that educational and cultural programmes should together occupy more than 30 per cent of the total air-time.

One characteristic of commercial television in Japan is the existence of stations specializing in educational broadcasts. Young as they are, it is noteworthy that they have already made a very promising start.

Some educational sociologists envisage a bright future for educational stations by pointing out, among other things, that the backwardness of Japan awakened the nation to the need for education after the Meiji Restoration and that this, together with the subsequent desire to 'rise-in-the-world' has, in some way or other, lasted until to-day. Considerable differences are also noticed in the content of

present-day broadcasts compared with those produced before and during the war by the NHK, then the single monopoly broadcasting station. Firstly, only after the war were voices of the general public heard on the air. The post-war programme 'Man in the Street', for example, presented the genuine voices of the general public. The fundamental freedom of speech which was the gift bestowed on the Japanese people by the defeat in the war was evidently reflected in broadcasting.

At the 'Radio Forum' were discussed such issues as the controversial points of the Constitution, the desirability of the Emperor system, rural problems, labour problems, and educational problems, and so on. While in the past only a one-sided viewpoint had been broadcast over the state-controlled stations, now broadcasts give the general public opportunity to hear various possible angles and to judge the issues for themselves.

Generally speaking, however, broadcasts still tend to concentrate upon entertainment for the general public, and there are few programmes which maintain high standards as far as content is concerned.

Audience of Television

Television, which is said to exercise a far stronger influence upon people than any other mass media, is bringing about several changes

TABLE XVII
TV AND CHILDREN'S HABITS

	<i>Daily Life Habit</i>		<i>Time for Newspaper Reading</i>		<i>Frequency of Movie-theatre-going</i>		<i>Interest in Book Reading</i>		<i>Time for Study</i>	
	<i>Plus</i> More time to talk with parents	<i>Minus</i> Later bed- time	<i>Inc.</i>	<i>Dec.</i>	<i>Inc.</i>	<i>Dec.</i>	<i>Inc.</i>	<i>Dec.</i>	<i>Inc.</i>	<i>Dec.</i>
	(per cent)		(per cent)		(per cent)		(per cent)		(per cent)	
Primary School	34	44	37	13	3rd grade 5 70 5th grade 3 60		25	9	14	22
Lower and Upper Secondary Schools	25	34	24	11	Lower 2 51 Upper 5 44		17	2	3	43

in the life of people as home reception spreads. One of the typical changes caused by television is in habits of children. How television affects the habits of children may be illustrated by Table XVII, which comes from the report of the Ministry of Education's survey on the influences of television conducted in 1958.

KANJI HATANO.

CASE STUDIES

IN this section a number of case studies are presented. They are intended to illustrate in more detail some of the issues previously raised by reference to policies adopted in selected areas or countries.

One group of problems might be regarded as technical. In his article on the use of television in colleges, Dr. Erickson compares the techniques, economics, and purposes of providing open circuit mass television programmes with those connected with closed TV circuits linking two or hundreds of colleges. In this latter kind of work, the author points out, the problems of personnel co-operation in the production of suitable courses and in the co-ordination of section teachers are very significant.

Dr. Pimsleur's article relates theories of modern language teaching to the practical possibilities of establishing language laboratories. Through the use of tape recorders, multiple reception headphones and response microphones, and booths ensuring student privacy, comprehension, pronunciation, conversation, and grammar exercises can be performed. Dr. Pimsleur indicates the present need in the United States, now actively involved in international affairs, for greater emphasis on language teaching, and mentions obstacles to progress.

The account by Mr. Morgan of a British Council experiment in using film in language teaching deals more specifically with the techniques of producing the film, and the pedagogical principles on which these were based. Mr. Mills throws light on programming considerations which have to be taken into account in language teaching by television in Iran.

A rather wider issue is considered by several contributors. It concerns sponsorship, and, by implication, control and censorship. Everyone recognizes that the production of *good* audio-visual aids to teaching is expensive. There is always the danger that "he who pays the piper will call the tune". Some observers naturally fear the consequences of national (or federal) government intervention whilst others doubt the wisdom of commercial sponsorship. In many countries the issue is just as alive in the case of textbooks and other printed material as in the case of newer media. The general problem shows several faces depending upon the context in which it emerges. Our case studies

reveal specific aspects of it, and show the different policies which have been advanced to meet it.

In the article on sponsored educational film-making in Britain the author, who wished to remain anonymous, writes as one "who has no set ideas about education but who has, over a period of some fifteen years, made school and classroom films as part of his film-making routine". The issues he raises are of considerable importance. "An educational film should be an educational film and nothing else," he argues. Few sponsors of films have such single-mindedness of purpose. Industrial sponsors, for example, frequently regard a film as part of their publicity programme. To the dangers of multiple aims is added the confusion which arises through failures to co-ordinate the efforts of producers, educational advisers, and cataloguing agencies. The writer implies, that for Britain the burden of educational film-making should have been shouldered by the government and other public bodies.

In many cases governments have taken an active part in promoting the use of audio-visual aids in schools. One feature contributing to government intervention is common to several case studies; it is the presence of a highly dispersed population. Related conditions affect the precise nature of the problem. Our articles show that a variety of policies are followed.

In Canada, for example, there are many rural schools. There exists the principle of provincial autonomy in education. Mr. Webb outlines some of the attempts which have been made to provide access for all schools to films and filmstrips which will help to interpret Canada to Canadians and at the same time be closely related to school curricula. In spite of a more centralized administration the problem in New Zealand is not very different. Mr. Lee and Mrs. Hattaway describe two ways in which the New Zealand government has tackled the difficulty of bringing modern education, in all its variety and richness, to rural and urban children and to minority groups. The checks and controls exercised by teachers on the operations of the schools publication branch are frankly discussed by Mrs. Hattaway.

Turning to India we note that Mr. Kumar's analysis turns on the need, in a recently created independent democracy, for a literate population and the extension of wider educational opportunities to all youth. Radio can contribute to this achievement. In spite of the efforts made by the Union and State governments, Mr. Kumar points out that a number of economic difficulties limit the effectiveness of the work. Rural development and adult education are also serious problems in East Africa. They are complicated by a multiplicity of languages. Great distances and a moderate communication system present dis-

tribution difficulties. Against this kind of background Mr. Granston Richards describes the work of the government-sponsored East African Literature Bureau. The radiophonic schools in Colombia were, according to the Rev. Ozaeta's account, developed to meet the needs of a widely dispersed population, 60 per cent of which lives in isolated houses and farms, 34 per cent of which has one year or less of primary schooling, and 43 per cent of which is illiterate.

The French experiment described by M. Dumazedier concerns the effectiveness of group viewing. The organization of rural teleclubs are described, and the possibilities discussed of creating a wider public for programmes of educational and cultural value and thus through television raising cultural standards generally. The usefulness of the medium as a vehicle of civic education in Germany is discussed by Professor Keilhacker chiefly from the viewpoint of organization, administration, and control. The advantages of a federal organization are weighed against those which flow from the more active participation of individual *Länder* in promoting the use of films in schools.

THE EDITORS.

Closed and Open-circuit Television Courses for College Students in U.S.A.

PRIOR to 1900 the significant advances in man's effort to multiply the influence of a teacher were the invention of written language, whereby a manuscript could carry the creative effort of a teacher to other places and times, and the development of the printing press, which afforded multiplication and wide distribution of the teacher's manuscript.

In the past sixty years, in rapid succession, have come a number of significant technical developments which have made possible the extension of the work of the teacher in both space and time. These include the silent film, the sound film, the disc recording, the tape recording, broadcast radio, and broadcast television.

All of these have found applications as an audio-visual aid to the teacher of a formal college class. In America, only radio and television have been used as a means of multiplication of the audience of the teacher of a college course, radio for extension education of adults, and television for both campus and off-campus instruction.

In the past decade there have been many experiments in the use of closed and open-circuit television for formal instruction of college students. These have varied from the linking of two classrooms by means of very simple closed-circuit equipment to the nation-wide open-circuit network presentation of a physics course under the caption "Continental Classroom", involving the co-operation of hundreds of colleges over the country and the enrolment of thousands of students.

For the most part, the closed-circuit experiments have been attempts to find how the services of a given teacher can be multiplied to serve groups in a number of classrooms. In some cases, the reduction of unit cost of instruction has been a motivating factor. In many cases there is an attempt to improve the quality of the teaching-learning situation by allowing the teacher to devote more time to preparation for the presentation of fewer lectures which can be presented to more people at a given time.

Experience in closed-circuit teaching leads most investigators to develop and to recommend studio facilities for presentation of television lessons without a studio class before the teacher. Production assistance to the teacher is advocated. Electronic two-way communication with students, often thought to be necessary in early develop-

ment of an installation, seems to dwindle in importance as a body of experience is acquired.

In many of the closed-circuit investigations, controlled experiments are conducted in which the educational progress of students taught by other conventional means is compared with the progress of those taught in television viewing rooms. For the most part, the results show no significant differences between 'experimental' and 'control' class students. This may be due in part to the fact that at the collegiate level the progress of a student is more related to his own self-motivation than to the mode of his instruction. It may also be due to inability of currently available examination devices to discriminate differences due to method. Whereas it is reasonably easy to measure progress towards information objectives, it is more difficult to evaluate progress towards other important objectives, such as critical thinking, subtle skills, and desirable attitudes or appreciations.

Television in Adult Education

Open-circuit television has also been used to extend the services of a teacher of a formal course. In some cases it is used to reach students regularly enrolled in a college or university. In other cases, broadcast television is used as a means of finding new adult students who might not otherwise attend college but who can profit from collegiate level study.

An example of the latter use is provided by the Chicago City Junior College, which since September 1956 has by television expanded its walls to include every television-equipped home within a radius of ninety miles. "TV College", as it is called, has been serving an average of 1,200 adult credit students per semester who have enrolled in some 2,400 course registrations in up to nine different telecourses per semester. These adults receive their instruction at home via WTTW, Chicago's educational non-profit VHF channel. A teacher-prepared study guide is used to co-ordinate the student's independent work, the lectures, and the occasional conference and examination periods which are held in the branch of enrolment.

The average age of the TV College student enrolled for this programme is thirty-five; he is mature and seems highly motivated. Controlled experiments have shown that these adult students have done as well as or better than either of their classroom counterparts—the college-age classroom students—or the evening college adults being taught the identical courses by conventional means. Many of these students have shown genuine interest in continuing their education by television. A number have secured the Associate in Arts degree, the two-year certificate granted by the Chicago City Junior College.

Obviously, a unique by-product of open-circuit television courses of the type offered in Chicago is the educational opportunity afforded to thousands of viewers who may be following as not-for-credit students or on an occasional viewer basis. The average viewing audience of WTTW is estimated to be 50,000 viewers. In one telecast a teacher may reach more different people than he might otherwise reach in a lifetime of teaching.

The Pupils' Responsibility

Another of the unique aspects of open-circuit instruction is the shift of responsibility from the teacher to the pupil in the learning process. The telecourse study guide may include an outline for the course, a list of the suggested readings, and a number of other study guide helps. The student assumes the responsibility for the following of the lectures via television, for doing the required and collateral readings, for writing the required papers, and for integrating all of the learning experiences of the course. Though our best teachers strive for the same goal in the classroom, all too often the student may seek and be given more guidance than is consistent with development of the skills of independent scholarship. The adult television viewer is apt to regard his experience as a unique privilege, and he throws himself into his work with industry and determination.

Any college television course can be transmitted over a number of stations by network connexions. Moreover, it can be recorded by kinescope or by the newer video-tape system for syndication. It is natural that these patterns for multiplying the work of the teacher should be explored. An inter-college network with the possibility of syndication of courses by video-tape is being undertaken in the State of Florida. Other state educational television networks are in the planning stage. In Oregon, a number of television sending and receiving points on college campuses are linked together in order to transmit instruction from one campus to another.

The telecourse taught on several campuses, via television or via a recorded series on a given campus, introduces a new problem on the educational scene. Whenever the television teacher is remote in space or time, it is necessary to provide the student with a section teacher who can provide guidance when needed and who can evaluate the student's progress.

In the Chicago City Junior College, where TV College links six faculties in as many branches, and in Oregon where several colleges are linked by television, experience shows that success depends on careful co-ordination of the efforts of the television and supporting section

teachers. Co-ordination of the work of one college teacher with another cannot be assumed. It is a prize won by mutual respect and understanding. This seems best achieved when television and section teachers can together establish objectives, select materials, and work out evaluative devices for the courses. In other cases teachers must learn the art of supporting another teacher, the television teacher. Perhaps college teachers of the future must receive special training in this skill.

Television teaching may have brought another unique problem to the college campus. It may be necessary to sort out students according to ability to succeed in certain learning environments. There may be a considerable percentage of students with a capacity for self-direction who can learn in the setting of television instruction with the nominal support of a section teacher. There may be another percentage of students who cannot achieve the goals of a course successfully by this means and who, because of immaturity or because of other factors yet to be determined, need the daily inspiration and careful guidance of a face-to-face teacher. This may have implications for counselling college students and for the administrative organization of the programme of instruction wherever television instruction is to play a significant role.

Television as a Unique Means of Instruction

There are a few instances that can be cited where television affords an instructional experience that could not be afforded by any other means. In Pennsylvania and in Illinois, prisoners have been given regular collegiate instruction via television. In Chicago and in other places, hospitalized and handicapped students have been given instruction via television. In some cases no other means of instruction could have served these people. Obviously, radio can provide some service to these confined students. Television seems to be doing this job better.

From the standpoint of the teacher open-circuit and closed-circuit television teaching experiences have been regarded as an opportunity for professional growth. In most cases there is an additional allotment of time given for preparation. This has varied from the doubling of time normally allotted to a course to the awarding of full-time work for the presentation of three half-hour telecasts per week. The teacher is placed in a co-operative or 'team' situation unique in his experience. He is usually afforded the help of a producer and a director who can help him capitalize on opportunities afforded by the medium. He becomes more keenly aware of his primary objectives, he culls and sorts his learning materials with greater care, he presents them with

more effectiveness, he minimizes those experiences which do not advance the learning experience materially, he builds on those experiences which will cause interaction by the student.

For the most part, the student appreciates this new experience of carefully prepared learning materials presented with skill and earnestness. In open-circuit courses weaker students tend to drop out, and the better students remain and seem to assume eagerly their role as self-directing pupils.

In open-circuit instruction there is a unique gain for the college and for education in that many of the constituency are afforded a view of the college classroom that they may never have been afforded before. The best teachers of the local educational institution are being placed directly in their living-rooms and the thrill of learning is given to many who have not otherwise had such opportunity.

It is not possible yet to cite universally applicable facts about the cost of using television as a means of widening the influence of a college teacher. In some closed-circuit experiments there is reason to believe that economies have been achieved when the number of students being taught by closed-circuit has been raised above 200 per class. In open-circuit instruction, the unit cost is very much related to the size and complexity of the television facility. With elaborate broadcast facilities like those of WTTW in Chicago, it is possible that an enrolment of 700 to 1,000 students per course is needed in order to bring the unit cost of television instruction down to that of conventional instruction. If, in this case, one considers the educational service to thousands of not-for-credit students and many thousands of other viewers, the telecourse presentation may be a real economy in providing adult education to an urban community.

In the twelve years since the advent of television, experimentation in its use in America probably leads to the conclusion that, with very few exceptions, college courses can be presented by open-circuit or by closed-circuit while maintaining student achievement at levels associated with direct face-to-face instruction. In only a few experiments has care been taken to compare television students with conventionally taught students in progress towards non-informational objectives such as skills and attitudes. This research can only develop as rapidly as we learn the technique of defining these non-informational objectives and of devising valid and reliable means of measurement of progress towards these goals.

More research is needed in the techniques of co-ordinating teachers, particularly in open-circuit applications where the work of instruction is divided between the television teacher and a supporting teacher who

makes occasional face-to-face contacts with the student and who evaluates the progress of the student.

Few would say that we can abandon all of our conventional means of instruction and proceed with the use of closed-circuit or open-circuit television with smaller staffs or with larger student bodies. There is some evidence already on hand which suggests that television has a place in the work of higher education. It is too early to predict its best uses or ultimate educational potential.

CLIFFORD G. ERICKSON.

Machines and the Teaching of Foreign Languages—U.S.A.

WE are witnessing a revolution in the teaching of foreign languages in the United States. While new methods have from time to time been introduced with much hue and cry, they have never attained the nation-wide significance of the present movement, supported as it is by the United States Government. During World War II, the Army's language teaching programme (ASTP) had great influence by demonstrating that large numbers of students could be taught to speak a foreign language. However, that programme, in which selected students devoted their full time to language study, took place under conditions so special that attempts to use similar methods in the high schools had but little effect. In contrast, the current developments in the teaching of foreign languages, including the introduction of machines in the so-called language laboratory, show promise of affecting every language class in America. I shall try to describe the present developments and the ideas which motivate them.

Tradition in the Teaching of Foreign Languages

The philosophy of language teaching espoused by the Latin grammar schools has permeated our schools to the present day. The teaching of foreign languages is similar in the United States, in France, in England, and in Russia. All bear the imprint of the tradition which demands that the well-rounded man should have an acquaintance with certain modern foreign languages, in much the same way as he should be acquainted with Latin (and, in some countries of Europe, Greek). He must be able to read their literature. For the attainment of this humanistic objective the student is put through a year or two of the grammar of the foreign language, then another year or two during which he reads works of increasing difficulty, and he may also try to compose writings of his own in the foreign tongue. In this traditional method of instruction, little or no time is devoted to the speaking of the language. It is a common experience among graduates of the public high schools that those who finally learn to speak a foreign language with competence do so entirely on their own initiative. Three years of French in high school does not prepare them to speak French when they get to France. This has been the experience of countless Americans. To many it is a source of regret in their adult lives.

The reasons for the present situation are several. First of all, teachers are asked to teach foreign languages which they themselves have learned very imperfectly. To speak a foreign language adequately most people require the experience of living for a while in the foreign country. The majority of language teachers have not had this advantage. Secondly, the colleges are to blame, for they have never placed the least emphasis on oral proficiency as a requirement for admission. They ask only whether a student can translate sentences from English into the foreign language, and vice versa. The dynamic, living language is the spoken tongue. Its written form, for all its unquestioned importance in communicating the mind's creations, is nevertheless the image of the spoken tongue, rarely its leader. However, the written language is considerably easier to deal with in the classroom. One can seize it and hold it fast on paper, while the spoken language is only a stream of thin air no sooner uttered than it is gone. Other school subjects concern themselves with the printed word, so that by the time they begin to study a foreign language the students are thoroughly conditioned to respond only to visual stimuli. As the spoken word is seldom dealt with, many students revolt when asked to learn foreign words without seeing them written down. Only that which is in black and white seems to have real existence for them. The intangible quality of the spoken word is frustrating and frightening. In marking, too, how much easier it is for the teacher to assign sentences to be translated and mark the number of errors made than to listen to a student say something in the foreign language and try to estimate its worth compared with the utterances of his classmates. The fact that we mark on the basis of written work gives the illusion of validity to our grading, for we can show the number of errors, correctly counted and subtracted from one hundred. We ignore the fact that our grading system is grossly unfair to the students with a talent for oral communication. Yet such students are in many cases those who would fare best if they actually had to learn the language in the native country. For all these reasons, and many more, our teaching of foreign languages is fettered to the written word.

Modern Conditions and Language Teaching

There is a traditional strain of isolationism in America. Many of our people still feel that there is protection in the expanses of water which guard us on the east and west, though the realization is of course becoming more widespread of our inevitable involvement in the affairs of one world. The implications of this involvement are now reaching the classroom. Public officials have awakened to the need for training our citizens in the skills needed for communicating with the citizens of

other countries. In time of war, a knowledge of foreign languages becomes a matter of national necessity. During World War II this sad argument impelled great progress in foreign language teaching. However, the need for foreign languages in the creation and maintenance of peace is quite as compelling. This realization was brought home by that most startling development of a peaceful kind, the Russian Sputnik. Americans were suddenly made painfully aware that their past successes would not ensure future eminence, and that fresh efforts were needed to keep abreast of the Russians in knowledge. With that realization, the teaching of foreign languages, long a stepchild of education, came abruptly into focus as a matter of national concern. In his report on American high schools, James B. Conant found that foreign language instruction was among the weakest elements in our schools, and argued for the urgency of lengthening and improving this aspect of education. Public concern, intensified by Sputnik, is demanding improved instruction in mathematics, science, and foreign languages. The first two subjects have already benefited considerably from the willingness of various funds and foundations to support their improvement. In the case of foreign languages, this is the first time that they have become the cynosure of the public.

This attention was translated into practical assistance by the passing of the National Defense Education Act of 1958. This Act, which I shall refer to as NDEA, threw the prestige and the financial support of the United States Government behind the movement to improve instruction in the three critical areas of mathematics, science, and foreign languages. The NDEA thereby made possible the revolution in foreign language teaching which we are now witnessing. All the necessary elements for that revolution existed already. These included the awareness that language instruction was woefully inadequate as regards the spoken tongue, the experience of pioneer language schools like the Foreign Service Institute, and a body of techniques developed by competent linguists. Given the impetus and the means to action by the NDEA, skilled personnel were already available to introduce into public education a new approach to the teaching of foreign languages.

The National Defense Education Act

Here are the provisions of the NDEA which affect foreign languages.¹

(1) Title III of the Act provides financial aid to the States for hiring

¹ For foreign readers it should be pointed out that education in America is controlled by State and local authorities. The Federal Government has no direct authority to impose educational policy.

supervisory personnel and for the purchase of audio-visual and laboratory equipment. Profiting from this aid (the usual arrangement is for the Federal Government to pay half if the State agrees to pay half), States which have never had trained people to supervise language instruction will be able to hire them. States will also have more incentive to find out about language laboratories and allot money for them.

(2) Title IV of the Act seeks to increase the number and the geographical distribution of the graduate programmes for the training of future teachers for colleges and universities. It provides fellowships for three years to send students to universities which agree to develop adequate Ph.D. programmes in language teaching or in literature.

(3) Title VI of the Act is the Language Development Programme. Part A provides for the establishment in colleges and universities of centres for the teaching of exotic languages which are not commonly taught but for which a need exists in government, business, or education (the institution pays half the cost). Part B provides for the establishment in institutions of higher learning of institutes for the advanced training of primary and secondary school language teachers. This provision concerns the commonly taught languages, the five commonest being French, Spanish, German, Italian, and Russian. Also included in Title VI is a provision for experimental research aimed at the improvement of teaching methods and the development of new materials, such as textbooks and tests.

(4) Title VII of the Act provides for "research and experimentation in more effective utilization of television, radio, motion pictures and related media for educational purposes". This title also provides for the dissemination of information concerning the use of these new media for teaching.

Though the funds to implement the Act only became available in the spring of 1959, some results may already be noted. Under Title VIB, twelve institutes for the advanced training of language teachers were operated in various colleges and universities during the summer of 1959. More than one thousand elementary and high school teachers attended these institutes, which subjected them to full-day intensive programmes for eight weeks. The institutes, whose staffs were generally selected from among university professors specializing in linguistics or in the culture of a particular language area, attempted to increase the teachers' proficiency in the language they teach (especially the spoken language), and to acquaint them with the new approach to teaching languages. In the summer of 1960 more than twenty thousand teachers will be subjected to a similar programme.

New Methods of Instruction

The new approach to which the teachers are being introduced rests on the recognition of language as a skill as well as an academic subject. The student must learn to *do* something. In this sense, learning a language is analogous to learning to play golf or drive a car, rather than learning the facts and concepts of history or physics. It is clear that so complex a skill as speaking a language can only be acquired by much practice. While it may take only a few minutes for the teacher to explain a particular element of the foreign grammar, it may take the student hours of practice to be able to use that element automatically and without stopping to puzzle it out each time. Consider the French sentence, *Je ne les lui ai pas donnés*. One could, within five minutes, explain according to traditional grammar rules the position of each of the words in that sentence. But to explain it is not to give the students the ability to produce such sentences themselves. The accomplishment of this objective requires hours of practice in which the student is confronted time and again with a stimulus situation, such as the question, *Avez-vous donné les journaux à votre père?* He must respond by saying, *Non, je ne les lui ai pas donnés*. A drill like this, in which the student is presented with a series of problem sentences to which he must respond according to a certain pattern in the foreign language, is known as a pattern drill. The hope is that by the use of pattern drills the student may be brought to the point of being able to produce a variety of syntactic forms in the foreign language with ease and fluency. Pattern drills may take a number of forms, but they usually consist of a stimulus sentence in the foreign language which the student must modify in accordance with certain implicit rules to produce a new utterance. These implicit rules, by which *Donnez-moi du thé; je le veux* becomes *Je veux que vous me donniez du thé*, may be made explicit. They then take the form of a traditional grammar rule. In the case of our example, the rule is that expressions of volition are followed by the subjunctive in French. Yet this statement is merely a way of verbalizing the behaviour of the French people when they speak. What is important is the ability to perform this linguistic act correctly, not the ability to verbalize it. Many a point of grammar can be learned thoroughly by practice, with little or no need for an explicit statement of the rule. A language teacher who realizes this fact will naturally alter somewhat his teaching and testing procedures. Teaching will aim at producing in the students the ability to utilize the syntax of the foreign language correctly. Testing will verify their ability to do so, either in conversation or in writing.

The new approach to language teaching emphasizes learning the

fundamentals of grammar to a point of mastery. To accomplish this objective considerable time must be devoted to practice, with the result that it may not be possible to touch upon all aspects of the foreign grammar within the limits of a two-year high school course. The sacrifice of some of the less common elements of grammar is worthwhile if made in return for the attainment by a large proportion of the students of an ability to speak the foreign language with some facility. There can be little doubt that the usual two-year and three-year courses fail, at present, to produce this ability in any except the rare, highly talented individual. The majority of students are turned out to echo the well-known complaint, "I studied Spanish for three years and can't say a word".

The Language Laboratory

Much has been done in the past ten years to explore the use of machines in the teaching of foreign languages. The idea of a language laboratory has achieved popularity very rapidly. Even before the NDEA, large sums of money had already been spent by colleges and universities to install machines to help teach languages. By sharing the cost with the States, the NDEA has multiplied the number of laboratories in secondary schools. One may ask what a language laboratory is, what it is expected to do, and at what cost.

The term language laboratory has been applied to equipment varying in complexity from a simple tape recorder costing \$150,² to a hundred-booth installation costing \$75,000 or more. In its simplest form, a language laboratory provides a means by which some or all of the students can listen to recorded material in the foreign language. A tape recorder with a number of earphones plugged into it serves this function.³ The cost of one tape recorder, with thirty pairs of earphones and the necessary connecting wires, is about \$650. (All costs given here are rough approximations.) With this equipment, students can hear foreign language material, including exercises which call upon them to give certain responses aloud. Since speaking aloud involves embarrassment for many students, the next step in building a language laboratory is to provide booths. These afford a measure of privacy by removing the student from the sight and, in part, from the hearing of his neigh-

² \$2.80 = £1.

³ The tape recorder is preferable to a record playback because tapes are more durable under repeated playing than records. The reason for the earphones, as opposed to broadcasting to the whole class through a loudspeaker, is that student concentration seems to improve through the direct contact. Moreover, when earphones are used, part of the class can listen while the others are doing something else.

bours. Booths are often built at little cost by the school carpenter. The next addition to the laboratory equipment that one might contemplate is that of a microphone in each booth. As he gives his response the student's voice is transmitted back into his earphones, so that he gets a more objective impression of how he sounds. The teacher may also wish to eavesdrop on the students' responses, in which case he needs a switching arrangement of some sort at a central control point with wiring to and from each student booth. The same wiring also permits the teacher to speak to any particular student, or to the whole class at once, through a microphone. It is a simple matter, in installing a central control panel, to make it also capable of sending more than one programme to the students, so that several different activities may be carried on simultaneously. For example, the class may be divided into three groups, according to their proficiency, and each group given an appropriate exercise. The three exercises are broadcast from the control panel to different parts of the room by means of a switching arrangement. The cost of equipping a thirty-position laboratory with microphones, earphones, three or four tape recorders and a control panel, will be about \$4,000, not including the cost of building the booths or sound-proofing the room.

The laboratories thus far described permit students to listen to foreign language material. The students may be called upon to respond aloud, and may occasionally be checked by the teacher as he listens to them one after another. But an important virtue of the tape recorder has not as yet been mentioned. This virtue is that it permits the student to compare his own pronunciation with that of a native speaker. Such comparison is said to make the student aware of his errors in pronunciation and to help him to correct them. This is the theory. In point of fact, the amount of benefit seems to vary with the talents of the student as an imitator and the supervision he receives from the teacher. Yet it is probable that all students derive at least some help from such comparison. Thus the machine makes available to the student an ever-present source of information about the spoken language, much as a textbook affords information about the written language. The fully equipped language laboratory provides each student with a means for recording his own voice interspersed with that of a native speaker. This involves equipping each student booth with a recording machine in addition to the equipment already mentioned. The cost is increased substantially. A thirty-position laboratory with a tape recorder in each booth may cost about \$13,000, exclusive of the actual booths.

The language laboratory is used mainly in elementary language classes. It is more commonly used in connexion with speaking and

understanding the foreign language than with reading and writing it. A variety of exercises contribute to these goals. Some of them are itemized below:

(1) *Comprehension exercises.* A selection is read to the students, about which they are later questioned.

(2) *Pronunciation exercises.* Phrase-by-phrase imitation of a native speaker is a common device. Specialized exercises are used for difficult phonemic and phonetic features.

(3) *Conversation exercises.* A question-and-answer technique is common.

(4) *Grammar exercises.* Pattern drills, described above, have been found helpful in the acquisition of a fluent command of syntax.

The language laboratory is more frequently used for drilling material already taught in class than for teaching new material. It is not a way of replacing the teacher, as some have feared. Rather is it a means of providing the repetitive practice which the students need, but which would be unbearably tedious for the teacher. The students may need thirty or more examples of simple sentences using an unfamiliar tense before they themselves can use that tense with some fluency. The set of practice sentences must be made up by a capable teacher. Once this job is done it is a task more worthy of a machine than of a teacher to repeat the sentences aloud at regular intervals, allowing the students to make some alteration which involves the point being studied. The machine can also provide immediate correction by giving the proper answer after the student has had time to attempt it.

The technique of immediate correction is an important feature of pattern drills for two reasons. First, it enables all the students to recite at once rather than only one at a time as in the classroom. At the same time, it still corrects each student. It thus multiplies manyfold the amount of time each student can spend in oral practice. Secondly, it prevents the perpetuation of an incorrect understanding of the point at hand by immediately informing the student as to whether his response was right or wrong.

Evaluation of the New Approach

In attempting to evaluate the new approach to language teaching, it must be remembered that we are in a period where great enthusiasm in favour of change is affecting the *status quo*. In fact, the revolutionary idea is not as revolutionary as it may seem, for certain language teachers have been applying its principles for years. Nor can one believe that the revolutionary idea will prevail entirely, and that future generations of Americans will leave the public schools with a fluent command of a foreign language. Yet it cannot be denied that the

current wave of reform arises from a real need. Indeed, such reform is long overdue, in Europe as well as in America, for foreign languages have too long been allowed to run their outmoded course. Though lip service is sometimes paid to the need for teaching students to speak the foreign language as well as to read it, this objective is little honoured in the observance, as may readily be seen by trying to engage a student in conversation in the foreign tongue after he has studied it for two or three or even four years. It is common knowledge that mathematics and foreign languages share the distinction of being the subject most cordially hated by American high school students. I cannot speak for mathematics, but as concerns foreign languages I wonder how it could be otherwise, since our schools persist in turning living languages into dead ones. French is the language by which Frenchmen speak to each other of affairs of the heart and affairs of the mind. When this lovely language is reduced to a matter of translating fifteen dull sentences for homework, the disappointment is the keener by the knowledge that it need not be so. Advocates of the new approach are not in favour of watering down language courses to make them palatable, nor do they wish to cease teaching students to read the foreign language. They want to attach more importance to the goal of speaking the foreign language in the belief that the best preparation for learning to read and write a foreign language is to learn to speak it first.

Many conditions oppose the complete adoption of the new approach. Teachers are insufficiently trained. Most teachers do not have a fluent command of the language they teach, though they may know the rules of grammar very well. A further obstacle is posed by the colleges, where language teaching is very conservative in its concentration on literature almost to the exclusion of speaking. High schools must prepare a substantial proportion of their students to pass college entrance examinations. Until very recently, these examinations entirely ignored the students' ability to comprehend and to speak the foreign languages they studied in high school.

In the classroom the grammar-translation method is easiest, though least satisfying, to employ. The many textbooks and familiar testing techniques relieve the teacher of much of the burden of creativity in his teaching. The pursuit of the teaching objective requires constant application on the teacher's part to maintain a high level of interest and to provide sufficient practice for all the students. The materials are slowly coming into being to help in this endeavour, but for the moment those teachers who concentrate on the speaking goal are in advance of the available published material and must improvise a good deal.

Techniques for testing the students' progress in speaking ability are just now being developed and are as yet unknown to most teachers.

Many who would like to pursue the speaking objective defeat their purposes by falling back on traditional testing techniques which place a premium on the ability to translate rather than on the ability to express oneself in the foreign language.

Despite these formidable obstacles, the new approach, supported as it is morally and financially by the government, cannot help but have a salutary effect on foreign teaching in the public schools. If only by the interest and controversy it arouses, this challenge to tradition will lead to a healthy re-appraisal of current practices. But more concretely, steps are now under way on a broader scale than this country has ever known to retrain older teachers and to train new ones. They are being trained in techniques for teaching students to speak the foreign language, including the use of pattern drills and of the language laboratory. Their own speaking proficiency is also to be improved to the point where they can teach others to speak. This is the movement now afoot. Because of this movement, the teaching of foreign languages in the United States is a more exciting profession at the present time than it has ever been before.

PAUL PIMSLEUR.

Language Teaching by Film: An Experiment by The British Council

LATE in 1958 the British Council and the Central Office of Information agreed to collaborate in making a short series of sixteen-millimetre sound films, suitable for television and ordinary projection, to be used in teaching English as a foreign language. Shooting began in March 1959 and the films were ready for distribution in September.

One of the first questions to settle was the level at which these films would teach. A course for complete beginners was too long, and consequently too expensive, to contemplate. One cannot offer a beginner, say, half a dozen lessons in English and then abandon him. It was decided that the films should be suitable for high-school pupils or adults whose English was at the level to be expected after about three years' teaching.

Their purpose would be to reinforce past teaching rather than to present unfamiliar items of the language. It was necessary, therefore, to select for presentation features of the English language which were fundamental but tended to be imperfectly learned. The eventual decision was to make three films, each with a particular aim. The first would demonstrate the more usual forms of question in English and characteristic responses. The second would demonstrate the principles governing the selection of tenses in speech which refers to the present. The third would demonstrate the more common usages of speech which refers to the future.

The teaching was to rest almost completely upon demonstration. Translation, or any other use of the learner's vernacular, was—irrespective of its debatable merits—out of the question, for the films were to be used in various countries. Explanation of grammatical principle was to be given sparingly and, when given, to be simple and phrased in easy terms. Two things would constantly have to be demonstrated together—a feature of the language and the context which called it into use. Two types of context make up the general context of a linguistic item, the verbal context and the situational context. The great joy of teaching language through film is that situational contexts can be created of greater vividness and variety than those of the classroom, the television studio, or the textbook.

Situational contexts had to be devised appropriate to the linguistic

features to be demonstrated. It was decided that the three films would be about a young man from New Zealand making his first visit to Britain. His situation would catch the interest of foreign learners of English and he would often use, in making his way around and meeting strangers, English of a kind particularly useful to a visiting foreigner. He would be the guest in London of a middle-aged Englishman who would play towards the audience the role of commentator and teacher.

Scripts were written by a British Council officer in consultation with colleagues in the Council's Education Division and with the producer, an officer of the Central Office of Information. The first script of *Questions and Answers* was considered unsatisfactory by his colleagues and, on second thoughts, by the writer. The central incident was too trivial and the setting too limited. At this stage it was agreed that the action had to take place against an interesting background even if the cost reduced the number of films to be made. Most foreign students of English are glad to become acquainted with the British background of the language. Moreover, to confine the production to a studio setting and one simple outside location, as the first script had done, would have been to throw away the main advantage of film over live presentation in the classroom or television studio—its capacity to demonstrate language in every variety of physical and social context. The three films eventually produced could have been made more cheaply in more restricted settings, but at a large sacrifice of appeal and teaching power.

The first film, *Questions and Answers*, opens with the arrival of Colin Groves, the young man from New Zealand, at London Airport. He is met by John Wilson, his English friend. The next morning he takes a walk round Westminster, Wilson's voice providing a simple commentary. When he reaches St. James's Park he has a conversation with a gardener and, on his advice, goes to watch the changing of the guard at Buckingham Palace. After the ceremony he takes a photograph of a mounted policeman who has been on duty during the ceremony, and during the short conversation that follows he decides to visit the training school of the mounted police to obtain material for an article for a newspaper in New Zealand. Later he is shown round the school by a senior officer who answers his questions about the training.

The situations in this film were selected because they stimulate question and response naturally, the visit to the mounted police training school being particularly useful because it furnishes a context of interesting visible activity for the questions asked.

The film concentrates attention upon three types of question—the question beginning with a verb (e.g. "Have you been to Buckingham

Palace yet?", "Do you mind if I take a photograph?", "Can you give me a light?"); the question beginning with a question-word (e.g. "What have you seen this morning?", "Where do they train these horses?"); and the 'question-tag' after a statement (e.g. "It makes the world seem a small place, doesn't it?"). It also demonstrates that a verb occurring in a response commonly takes its tense from the question ("Where do you come from?" "I come from New Zealand" and not "I am coming from . . ."—as many foreign students will say).

The teaching points are made in this film, as in the other two, by flash-backs at the end of short stretches of dialogue in the main part of the film. First, the short passage is repeated in both sound and picture; then the sound-track is repeated again with the important sentence or sentences thrown in print upon the screen. A group of extracts displaying the same language-pattern, with visual reminders of the contexts in which they were spoken, makes a grammatical point so vividly that very little commentary is needed. John Wilson introduces a flash-back or, more usually, a group of flash-backs with some short and simple comment which normally merely draws attention to the point to be studied (e.g. "Now notice how people ask questions beginning with 'What', 'How', and 'Where'"). Elaborate or subtle explanations of grammatical principle are altogether excluded.

In the second film, *Talking about the Present*, Colin visits Crawley, a 'new town' in Sussex, where he has the plan of the town explained to him by one of the staff of the Development Corporation, and goes to the town centre, a school, and a residential area. He talks with the head mistress of the school, a shop assistant, and a housewife. This visit to Crawley provides almost ideal situational contexts for the language patterns and usages to be demonstrated. The activities of the school-children furnish perfect contexts for the present continuous tense (e.g. "These children are doing sums", "That little boy isn't doing sums; he's reading a book"), and there is every opportunity to demonstrate in other parts of the film that verbs such as 'hope', 'like', 'want', 'suppose', and 'see' are used in the plain present tense (e.g. "I hope Mrs. Brown is at home"), when verbs relating to observable activity would be in the continuous. The film also demonstrates the use of the plain present to talk about events that happen regularly but are not necessarily happening at the time of speaking (e.g. "We have open-air concerts here in the summer" against a background of Queen's Square in March, with leafless trees and an empty bandstand), and the conversation with Mrs. Brown, who had moved with her family from London to Crawley, gives an opportunity of demonstrating, in a clear context, the parallel employment of 'used to' (e.g. "He used to spend nearly a pound a week on train fares; now he spends nothing on fares").

The situations in the third film, *Talking about the Future*, lent themselves equally readily to our teaching purposes. In this film Colin visits the Port of London and goes on board a ship that is sailing for the Far East on the following morning. He talks with a driver who delivers cars for export, the captain and first officer of the ship, and a young cadet about to make his first voyage. The captain, using a map, describes to Colin the course the ship will follow, the captain and the first officer discuss what is to be done before the ship sails, and the cadet tells Colin what he will have to do before he qualifies as a ship's officer. We hear the characters use 'will' and 'shall' or, more often, their shortened forms. They also use the 'going to' future, the present continuous combined with a future adverbial (e.g. "*Yes, we are sailing to-morrow*"), and verbs such as 'expect' and 'hope' with the infinitive (e.g. "*I expect to have all this cargo on board by six o'clock this evening*"). The other usage presented is a difficult one for many foreign students—the employment of a present tense after a conjunction which ties it to a verb in the future (e.g. "*Then you'll be able to get a few hours' sleep before we sail*"). However, the teaching point is very simply made in the recapitulation, with a word or two of commentary to draw attention to it and the verb underlined when the sentence is thrown on the screen.

In all three films the teaching rests upon demonstration, exploiting the power of film to demonstrate the situational context of language. The more important features of the language used in a film are reduced to order by the recapitulations and brief commentary at the end.

While the more obvious and systematic teaching is done by the recapitulations with commentary, perhaps the more useful function of these films is to show, as they do from beginning to end, how simple and straightforward patterns of English presented in the classroom may be employed by native speakers of English in contexts natural to life in Britain. If English to the learner is a dull and alien language associated only with the teacher, the blackboard, and the book, it is our hope that these films will help to bring life into the language he has so far learned.

Another function of films of this kind, which use speech that is real but restricted in vocabulary and structure, will be to provide a bridge between the English of the classroom and that heard from the sound-tracks of normal feature and documentary films. The value of 'bridge readers' to foreign students of English has long been recognized. 'Bridge films' might be equally valuable in teaching the spoken language.

Unfortunately good films are bound to be expensive. If dialogue is to be convincingly spoken against convincing action, well-paid profes-

sional actors must be employed. The settings must be spacious and interesting, otherwise there is little point in preferring film to cheaper media of presentation. It is no economy to have material ruined through failing to employ, at the proper fee, a competent editor. The total cost is unlikely to come to less than £80 a minute. However, the audience that a film can reach through television and normal projection is so vast that the cost per pupil of presenting a fifteen-minute film will be very small indeed. There are parts of the world where hundreds of thousands of students are trying to learn English with no opportunity to hear English, of a kind they can follow, spoken by native speakers of English in an authentic environment. The value of suitable films for teaching English in these parts of the world can hardly be exaggerated. Relative to the usefulness and scale of assistance they would bring, the cost would be small and well worth bearing.

D. Y. MORGAN.

The Film Producer, his Sponsors, and Educational Considerations—A British Viewpoint

EDUCATIONAL films, including school and classroom films, are usually made by three kinds of people: either (a) by educationists or subject experts (such as scientists) who try their hand at film-making as amateurs; (b) by teachers or scientists who have turned professional film-makers; (c) by professional film-makers who are neither educationists nor subject experts but who, through their work, acquire a certain knowledge of the basic issues involved in the educational field. I belong to the last group, and whatever I say should be read as coming from a person who has no set ideas about education but who has, over a period of some fifteen years, made school and classroom films as part of his film-making routine. These films were commissioned by sponsors on given topics and had to be made in accordance with definite instructions as to contents, length, style of treatment, etc. The films dealt mainly with science subjects. The following observations deal with a few problems of a practical nature which I encountered at some time or other while working on these films, all of which were made in the British Isles.

The Audience and the Adviser

Every film director wishes to have (or ought to have) a clear idea of the audience for which his films are intended and of the conditions under which they will be shown. This need is fairly easy to satisfy in some fields, and rather difficult in others. In the case of educational films, even a modest kind of 'audience research' by the film director seems to be regarded as unnecessary by the sponsor. While usually an adequate allocation of time and money is made for the film-maker's subject investigation and technical research, no facilities are provided for pre-production visits to schools; in all the years of my film-making I have never once been given the opportunity of watching how a film is used by the teacher in classroom work and how the children react.

It is true that an educational adviser is generally appointed for a given production. This is an excellent idea which could solve many of the film director's problems. My experience has shown, however, that things don't work out like that. Sometimes an adviser is chosen mainly for the sake of his name, and his connexion with the film is purely

nominal. In other cases the adviser is consulted by the sponsors themselves, so that the maker of the film receives his opinion or suggestions at second or third hand and probably coloured by the sponsor's own views. Or again, an adviser may be nominated but is for one reason or another inaccessible until the film is almost finished. It has twice happened to me that the first time I set eyes on my 'adviser' was at the double-headed showing of the film—i.e. after the commentary had been recorded. Such a tenuous liaison with the educational side is not helpful: I often had to grope in the dark, or find other means of information with regard to points such as the level of knowledge or the degree of intelligence one could associate with certain age-groups.

There is an additional point: it is more than probable that during a complex production lasting several months both the sponsor and the maker of a film will lose their balanced judgment to some extent, and also their opinions might sometimes differ as regards certain details of treatment or presentation. An adviser, familiar with the subject but removed from the day-to-day problems of film work, would be the very person to act as a guide and referee. But he must be 'on tap'.

On the other hand, having an educational adviser at one's elbow all the time is not an unmixed blessing, either. Once, in the case of a major production, there was a 'resident' educationist attached to it who had his office next to mine. He had a science degree, had been a science teacher and thus was well qualified to act both as technical and educational consultant. The difficulty was that he was over-conscientious and tried to find ever-better ways of presenting certain details. He was liable to suggest alterations, not only immediately before shooting or during shooting but also after shooting. This caused long arguments and delays on the set, and as he never came to the studio in person, many discussions took place over the telephone—a particularly irritating habit when reference to difficult diagrams became necessary. Here a seemingly very useful idea went wrong because the adviser lacked sufficient knowledge of the way films are made; he thought that a wrongly conceived film-scene (shot perhaps under great technical difficulties) could be 'crossed out' and 're-written' on celluloid with the same ease as on paper. It is quite clear that a grasp of the fundamentals of film technique is a 'must' for everyone connected with making films.

From all this it appears that the ideal arrangement would be to have an adviser, nominated by the sponsor at not too high a level, readily accessible and available both before the start of production for discussions of script and presentation and during production for advice on details and for acting as a mediator when required. It would also be a great help if sponsors could arrange for film-makers to attend a few

school classes so that they can learn how films are used by different teachers.

Problems of Sponsorship

An educational film should be an educational film and nothing else. Since the Government has almost given up commissioning films for use in schools, such films are now mainly sponsored by big industrial concerns. We can be thankful that these firms have taken on—for whatever reasons—some of the responsibilities which should have been shouldered by the Government and other public bodies. But this industrial sponsorship brings with it a certain duality of purpose. A big manufacturing firm is apt to regard the release of one of their films as a good opportunity for publicity; a Press show will be arranged and the film will subsequently be sent to a number of festivals. Therefore the sponsor might insist on a number of features which he imagines will appeal to Press and festival audiences, such as a sophisticated design of the titles, modernistic music, or a certain manner of speaking the commentary. All this might swallow up a proportion of money which would be better spent on the treatment of the subject-matter itself; these features are also often the opposite of what the teachers demand from a film—no music and simplicity of speech and printed type.

The film department of a big firm is usually run by the head of publicity who, as often as not, regards a film as just another propaganda medium which, for reasons of prestige, must bear at least some of the marks of the firm's usual advertising output. In a recent production I was denied a little additional money for improving a sequence and making its difficult concept easier to understand; but ten times as much money must have been spent on the reception which followed the Press show. This sort of thing breaks a film-maker's heart, much as he may enjoy his drinks at the party. Perhaps, in good time, a better appreciation of values will come to prevail in the film departments and board rooms of the sponsoring concerns.

The Danger of Multiple Aims

Speaking of duality of purpose, there is one more aspect to be considered. A film should be made with its intended audience in mind. Often a sponsor hopes that a classroom film might also do for general audiences. But it is very rare that a film succeeds in pleasing several types of audiences (this is not necessarily true with entertainment films). For instance, a scientific film for classroom use may be packed with a great amount of information because it is designed to be shown to the children at the time their curriculum deals with the subject; the audience is therefore receptive and in a condition to understand and retain

the details explained by the film. The film may also be shown to the class not in one continuous performance, but broken up into sequences. The teacher can thus discuss each topic immediately after it is shown; he can answer questions; he can re-screen each sequence as often as he thinks necessary. A film of, say, twenty minutes' running-time can thus be shown to the children spread over several lessons and over a period of weeks. In this way it may serve its purpose excellently.

The same film, shown to an adult audience in one continuous screening, can fall completely flat. Whatever these grown-ups have learnt in school about the subject—if they ever have—may be long forgotten; for them the film contains too much information on a subject which is above their heads; they can't follow the explanations because there is no pause for them to think and digest; they become irritated, annoyed, or bored. To them the film might appear downright bad.

I think the future will teach us to be much more discerning in matters of specialization and to acknowledge that it is better to make a film which does one job really well than to try and adapt it for various purposes.

The Need for Co-ordination of Effort

Co-ordination in the field of educational films could be better. At the moment each sponsor seems to work in a water-tight compartment, issues his own lists, arranges for his own distribution, and so on. There does not even seem to exist a catalogue which lists all existing educational films under suitable headings. I do not know what the effect of all this is on the user of educational films; it certainly makes work harder for the maker of such films. The first thing a film director wants to do after receiving an assignment is to find out whether films or film-strips of the same subject exist already and to screen them as part of his investigation routine. With the system as it is at present, he has to consult a great number of individual catalogues and lists. Not all films are listed under a subject index; he may have to run through pages and pages of irrelevant matter and in the end miss the one film he wants to see most. He might thus duplicate something which had been done before, perhaps been done even better.

Would it not be possible to create a central bureau which would receive a print of each film classed as educational and which would issue subject catalogues on the lines of those published by the Scientific Film Association? Such a bureau would be of greatest value to sponsors, makers, and users of educational films alike.

Some time in the future a similar pool should be created on an international scale. There is much too little connexion between the countries; the film office of the Western European Union seems to be a first

attempt at international co-operation, but too little is known about the way it functions.

The Nature of an Educational Film

What is an educational film? Or a classroom film? No clear definitions exist—perhaps they cannot exist. The field is immense, and each category of teaching film (science, geography, language, natural history, etc.) may require an entirely different approach. The same applies to the kind of audience (age-group, country, type of school, etc.).

There are therefore no established standards for educational or teaching films, and anybody can please himself by making educational films or calling his films educational. Whether the teachers will use them is another question. The English educational system leaves great freedom to the individual school or teacher, contrary to most systems prevailing on the continent of Europe, where things are more centralized and educational policy is often made by the Ministry of Education and applied to all the schools of a country. In England, if a teacher does not fancy the use of visual aids, he is entitled to teach without them.

Of course, there are a number of 'golden rules' in educational film-making. Some of them have been evolved years ago and may, or may not, still be valid to-day. With the rapid expansion of the fields of mass communication, psychology, medicine, and modern teaching methods, the time has surely arrived for an investigation into visual teaching methods to take place, similar to those made into children's entertainment films and children's television. Again, greater co-ordination of all contributing factors and bodies would be invaluable and could result in certain acknowledged standards of technique and style.

Many teaching films over the years, seemed excellent in conception and execution. But many more seemed pedestrian and uninspired; dull diagrams are often used where a more lively technique, using three-dimensional models, special effects, and a generally more dynamic approach would be more likely to engage the attention of the pupils. Of course, the usually restricted finance in this field does not encourage adventures and experiments, but these are exactly the features which are most needed in this still new and largely unexplored medium.

The making of educational and teaching films is very exacting and often worrying work, but it is an interesting, congenial job; a job which one feels is worth doing and which opens a window to fields of knowledge and aspects of life which one would rarely have come to know if engaged in more one-track sort of work. Often, say, with a scientific subject, one has to absorb an enormous amount of unfamiliar matter; and just as often, once the film is finished, one has rapidly to forget all about it to make room for the next intake of subject-matter in an en-

tirely different field. This surely is an uneconomic way of doing things; it is hoped that with better co-ordination in future, more rational production methods will be evolved and much waste avoided.

The Importance of Good Classroom Technique

There is also need for paying attention to the purely technical side of classroom projection of films. I have no experience in this field at all, but have often been told that the conditions under which some films are being shown leave much to be desired. It would be a great pity if through inadequate presentation an otherwise excellent film became almost valueless. Some sort of standardization of equipment and procedure would probably be a great help to teachers and schools which, at the moment, have to choose their apparatus and methods from a bewildering variety of equipment thrown on the market.

CONTRIBUTED.

The Development of Film and Filmstrip Use in Canadian Schools

THE responsibility for education in Canada, as defined by the British North America Act of 1867, is a provincial one. A description of any phase of educational development in this country should take this fact into account. We must, therefore, consider ten separate and distinct educational systems similar in many respects, yet differing in varying degrees in their philosophy and methodology. At times, however, it is expedient that Canadian education speak with a single voice. This is achieved by the Canadian Education Association, which is supported by all provincial departments of education. The development of film and filmstrip use in Canadian schools has, in a sense, been ten separate occurrences. In this article, however, we shall, of necessity, speak in broad general terms and emphasize similarities in trends rather than differences.

It was not until after the Second World War that the use of audio-visual materials began to increase in Canadian schools. Some pioneer work had already been done in this field, but the main significance of this was probably because it was pioneer. The war period particularly served to accelerate the production and use of films and filmstrips for instructional purposes with the armed services. The increased audio-visual post-war activity in Canadian schools was due, at least in part, to this factor. Although a number of Canadian educational administrators and practising teachers became aware that, in the business of effective teaching, visual communication is not only an important but an essential element, teacher training institutions did not immediately offer courses in the philosophy and utilization of audio-visual materials. However, in most provinces department of education film libraries, as well as some operated by municipal boards of education, were established. It would be difficult to state with any surety whether the development of these libraries provided the demand for school films or vice-versa. Nevertheless, in most instances these libraries fell somewhat short of meeting all requests for specific films.

The National Film Board

The bulk of school films purchased by these film libraries came from producers in the United States or in the United Kingdom. However,

there was a lack of materials on Canada itself—a basic element in all Canadian school curricula. Producers of school films outside Canada had endeavoured, with some success, to fill this gap. Despite this, there was a feeling that films on Canada for Canadian schools should be produced in Canada. In 1939 the National Film Board was created by an Act of the Canadian Parliament, specifically charged among other things to produce films to interpret Canada to Canadians. The importance of this function can be realized when one considers the need for developing a sense of national identity in a young country the size of Canada in which, even to-day, many persons live and die without ever entering another province.

National Film Board films became available through circuits, library deposits, and purchases. As distribution grew, a number of educators across the country became aware that in these films was visual material on Canada, available from no other source. Despite an adult orientation much of this material was closely related to school curricula. Suggestions were made to NFB that a number of these films should be revised to make them more suitable for use with young students and, further, that future production should take school needs into account. At first these suggestions were scattered and unorganized, but even in the years immediately following the war a serious attempt was made to produce some films suitable for juvenile audiences. By 1949, however, the various provincial departments of education, under the aegis of the Canadian Education Association, met in Ottawa to discuss with NFB the possibility of the creation of a committee which would advise the National Film Board on the modification of some existing films and the production of some future films in order that the resultant materials might have a sound pedagogical construction. Out of this meeting came the formation of the Canadian Education Association National Film Board Advisory Committee, which met for the first time in 1951 at Ottawa. Representation on this committee was offered to all provincial departments of education, the Canadian Teachers' Federation, the Canadian Home and School and Parent-Teacher Federation, the Canadian Education Association, and an annually selected municipal teaching-aids centre. The committee's functions were to be threefold:

- (i) To advise NFB on the kind and preparation of films and filmstrips which would be of use in education.
- (ii) To advise on the adaptations of films and filmstrips already made.
- (iii) To give suggestions on the production of certain films and filmstrips being prepared for Federal Government departments to allow for their most effective use as classroom aids.

One might possibly wonder why the individual provinces did not set up film and filmstrip production units to meet the needs of their own curricula, or possibly why an independent commercial producer or producers did not endeavour to enter this field? Because of the very nature of Canadian economics, such ventures could hardly have been commercially successful without some form of financial assistance. This is not to say that some film and filmstrip production has not been carried out by departments and boards of education. However, this has been more of an experiment and has really not been a serious attempt to meet in full the requirements of the schools. Materials produced outside Canada which treat subject-matter not peculiarly Canadian have been quite successful, and there has been no apparent need to duplicate this type of production.

Although it has been indicated that the CEA-NFB Advisory Committee came about largely because of the interest of Canadian teachers in audio-visual materials, one should not be led to believe that this was a great surging force across the nation. As in the case of most movements towards change and newer ideas, the impetus was supplied by a relatively few dedicated people. While Canadian educators now generally recognize the desirability of using audio-visual media in the classroom to the extent that they set aside funds for the support of film and filmstrip libraries and allow grants on the purchase of audio-visual equipment, as yet teachers' colleges do not in every instance provide instruction in the proper use of these materials. This lack is due, in part at least, to the tremendous strain which has been placed upon these institutions since the war to meet the demands of a burgeoning school population. Many provinces offer summer courses in audio-visual education methods as well as in-service training during the school year. In several instances, National Film Board officers have been invited to assist in those areas which are their special competence.

Distribution of Film

Film distribution in a country as large as Canada can be a problem. The provincial department of education film library, usually situated in the capital city of the province, endeavours to supply requests for films from teachers in that province. As already mentioned, this service has been supplemented or undertaken by municipal board of education film libraries in such cities as Toronto, Montreal, Vancouver, and Victoria. The cost of expressing films to schools from the central department of education film library is, in some cases, borne completely by the department while, in other cases, express charges are paid one way. It is still difficult to supply films to schools perhaps hundreds of miles away from the central library. In some instances, to over-

come this problem blocks of films were deposited at other centres so that a more complete coverage could be obtained. Nevertheless, the choice of film for the classroom use was still somewhat limited. In the last few years, some of the provinces have been proceeding with a decentralization programme. This is an effort to encourage municipalities and school districts to set up their own school film libraries. In such instances, the department of education would agree to supply a basic library of films if the municipal board would purchase an equal number and, at the same time, provide a full-time trained audio-visual consultant. While the success of this venture cannot as yet be fully assessed, it would appear that it is working well and is helping to a considerable degree to ease the strain on the central library while, at the same time, providing an improved film service.

There have been and still are many rural areas which even if they are able to obtain films from the central library have no projection equipment with which to show them in the classroom. In many cases these are one-room rural schools in which all the elementary grades are taught by one teacher. Since the war and with the assistance and support of the National Film Board, the Film Council movement has grown in Canada. There are approximately 475 councils in existence to-day. In various townships and counties various groups and associations interested in film as a tool for furthering the aims and objectives of their respective organizations have come together to pool their financial resources for the purchase of films. Many school boards have seen fit to take membership in these councils in order that the schools under their jurisdiction might be assured of an extended film service. With the support of the various film councils the rural film circuit movement developed. In this form of distribution, programmes of two or three films would move from showing point to showing point along with projector and screen according to a fixed time-table. Frequently, this meant a daily transportation problem. Many of the showing points on these circuits were schools, and the audience, once mainly adult, gradually changed in character until school children accounted for over 60 per cent. In specific provinces this could be as high as 90 per cent. Each year, at NFB headquarters eight of these forty-minute programmes are prepared along with appropriate study guides. This means a provision of forty-six prints of each film used. Where schools are concerned the service is provided with the knowledge and co-operation of the local educational authorities. In some provinces, the rural circuit programme for schools carries with it a number of films from other producers supplied by the department of education film library for this purpose.

The silent film has been rarely used in Canadian schools except by

those few pioneers in film use whose activities in visual education pre-date the advent of the sound film in the classroom. This is substantially true of all classroom film use in North America for, unlike some parts of Europe, the pedagogical controversy about the advantages and disadvantages of the sound and silent films has never become a matter of great issue. In fact, many of the 16-mm. projectors now being purchased cannot be run at silent speed.

It is a reasonable assumption now that practically all urban graded schools and all rural district schools, where a multi-classroom building has been erected to serve the needs of a wide area from which children come daily by bus, own or have available for use a 16-mm. sound film projector. In 1956 the Canadian Education Association sought audio-visual statistics from the various provinces. The resultant report indicated that there were at least 4,000 16-mm. projectors available for school use in Canada, and it would be a reasonable estimate that in 1959 this figure was over 7,000.

The Use of Film

Films, like books, can be badly used in the classroom. The unwise use of film has probably not completely disappeared, and the criticism that the class was being merely entertained during film showings is, as time goes on, becoming less valid. The sound film is more the victim of poor utilization than the filmstrip. The use of this latter medium has grown very rapidly in the last five years or so. Because of the very didactic nature of the filmstrip, it almost demands good class utilization. Being virtually an extension of the teacher's personality, it cannot stand unaided in the classroom. Better teachers recognize the strength of this medium, and although there is no inherent conflict between the sound film and the filmstrip, the use of the latter is increasing rapidly, not only because of its value as a teaching tool but because it is inexpensive and easily obtainable. In the vast majority of cases, films are booked from a library which may be in the municipality where the school is located, or may be several hundred miles away. Filmstrips, on the other hand, have become more and more something which can be kept permanently in the individual school. In fact, the majority of the larger schools maintain at least one filmstrip projector and, even more significantly, a filmstrip library which may run to over a hundred prints. The responsibility for the maintenance of this library may be the principal, vice-principal, or a teacher who has a special interest in the use of audio-visual materials.

In any discussion of classroom use of projected visual aids the question of a suitable showing place arises. This can present a difficulty which is not peculiar to Canada. Ideally, every classroom should be

equipped for the showing of films and filmstrips. However, this optimum situation still seems to be a long distance in the future. One-room rural schools have managed at modest cost to blackout the classroom by means of drapes or have employed other shields of cardboard or plywood to cover the windows. The average one-room rural school is, in many instances, a product of the nineteenth century or of the early years of this century, before the advantages of well-lighted classrooms were appreciated, let alone realized. Glass brick walls, of course, did not exist. The blacking out of classrooms in the ultra-modern multi-room school is a serious problem. This has been met head on by many progressive school systems where classrooms can be darkened by either drapes or special venetian blinds. Other schools set aside a special classroom for showing films or, in some instances, the stage of the combined auditorium-gymnasium has been designated as the audio-visual room. While this latter situation falls short of what most audio-visual enthusiasts desire, nevertheless efforts in this direction, although not completely adequate, are indications that Canadian schools are attempting within the limits of their resources to provide a solution to this problem of good utilization of film in the classroom.

Filmstrips

Almost without exception, filmstrips used in Canadian schools are single framed and captioned. This again, as a matter of interest, is at variance with the practices in some European schools, where filmstrips are double framed and uncaptioned. As in the case of the previously mentioned question of the use of sound or silent film, the matter of captions has not sparked any significant pedagogical controversy. It would be safe to say that Canadian teachers will not use uncaptioned filmstrips. Ten years ago coloured filmstrips were few. The National Film Board, for instance, produced practically none, but, in the last five years, the popularity of coloured filmstrips has grown to such an extent that the National Film Board is now producing over 60 per cent of all its filmstrips in colour. This situation obtains also with filmstrips from other producers being distributed in Canada.

As has already been pointed out, filmstrip distribution in Canadian schools is gained by direct sales, although it is still possible in some centres to draw filmstrips from the central library. By and large, it is quite clear that the present practice, and one that is increasing, is to have a filmstrip library permanently located in the individual school itself. It is estimated that there are between 8,000 and 10,000 filmstrip projectors in Canadian schools, and that in the fiscal year 1958-9 there were probably as many as 75,000 filmstrips sold of which nearly 20,000 were produced by the National Film Board. The majority of these

were made with the approval of the CEA-NFB Advisory Committee.

Even now, general interest of teachers in the possibilities of films and filmstrips as a part of their lessons is still somewhat limited. It is the little knots of teachers who endeavour to spread their enthusiasm to the general body of their colleagues. Teachers' associations, in some provinces, have established audio-visual committees which meet once or twice a year to discuss new films and filmstrips, while between meetings they test and evaluate the newer releases. The majority of directors of audio-visual branches in provincial departments of education and supervisors of municipal audio-visual centres occupy positions created for the most part since 1945. Most of these people hold membership in the Department of Audio-Visual Instruction, or DAVI as it is known, a part of the National Education Association in the United States. As well as receiving literature and other material on audio-visual developments in the United States and abroad, many attend the DAVI Convention which is held annually in different centres in the United States. By 1957 the movement in Canada had grown to such proportions that it was decided to form a Canadian Branch of DAVI, which has been named the Canadian Audio-Visual Association and now has a membership of nearly a hundred.

During the last twenty years, and particularly since the war, the National Film Board as an agency both for production and distribution of films has stood ready to assist on request in the development of film and filmstrip use in Canadian schools. The CEA-NFB Advisory Committee since 1950 has been virtually the sole effective national voice encouraging the use of good visual materials in the schools. Arising out of its functions already noted has been added one of evaluation. Whenever the National Film Board productions, both films and filmstrips, which have been prepared with the classroom in mind, or because of their nature appear to be suitable for classroom use, are shipped to members of this committee, they, in turn, have these productions pre-viewed by interested teachers and actually tested in classroom situations. Results of their findings are reported to the secretary of the committee, who arranges for their collation and reports his findings to the producers of classroom films and to the members of the committee. This process, which has been refined in the last few years, is having a salutary effect upon materials being produced with a resultant rise in the degree of usefulness which they may have in the classroom.

Economic Considerations

Canada is a relatively wealthy country with a high standard of living, yet with a small population which, in many places, is quite scattered.

The production of films and filmstrips for Canadian schools by Canadians themselves which would cover the whole curriculum appears to be an economic impossibility. The National Film Board, at the suggestion and with the approval of the various departments of education through the efforts of the CEA-NFB Advisory Committee, has attempted to solve this problem at least in part. The results have been quite gratifying. As well as the economic difficulty of extensive classroom production, there is also one of distribution. This has been solved to a considerable extent in the more densely populated areas and in areas where there exist regular train and bus express services. The depositing of film blocks, the efforts at the centralization of film libraries, and the circuit distribution of films have done much to meet the needs of Canadian teachers and students.

Although Canadian schools will continue to use materials produced in other countries, and wisely so, the increase in the use of films and filmstrips produced in Canada should continue. What effect the newer audio-visual media will have in schools cannot be accurately predicted. As film and filmstrip use expands, new methods of distribution which are developing should provide immeasurable help in making these materials available, not only in more densely populated areas, but especially in those areas quite remote from film-distributing centres. The net result should be a wider and wiser use of audio-visual materials in Canadian schools.

JOHN D. WEBB.

*The Technical Correspondence School of the
New Zealand Department of Education*

To be asked to teach subjects ranging from animal husbandry to ventilation of coal mines, as intricate as surveying computations or television servicing, as utilitarian as English for engineers or calculations for carpenters, and as practical as commercial gardening or woollen yarn manufacture to students as diverse as first-year apprentices and middle-aged business administrators would be a considerable task for any technical college; but to be required to teach all these subjects to all these people by correspondence is a challenge indeed.

The Technical Correspondence School operated by the New Zealand Department of Education has met this challenge so successfully that it is growing at the rate of about 16 per cent per annum. In April 1959 the teaching staff numbered seventy, and the roll of students, of whom about two-thirds were apprentices, stood at 3,840. These figures were reached in about twelve years from a very modest beginning when a principal and four teachers took over a service provided by the New Zealand Army Education and Welfare Service, together with some technical correspondence tuition that had been started in a small way by the Wellington Technical School.

To-day the school is in some ways the most advanced technical college in New Zealand.

The population of New Zealand is small in relation to the physical size of the country, and although about 18 per cent of the people live in metropolitan Auckland and approximately a further 24 per cent in the other three main centres of population, there are many courses for which a sufficient number of students cannot be assembled even in one centre. The provision, on a national basis, of educational facilities for these is one of the main activities of the Technical Correspondence School. In some subjects, particularly at the technician level though to some extent at the trade level, too, it offers the only tuition provided by the State system; that is true, for example, of textile manufacturing, surveying, and dairy factory management.

For other subjects, however, the Technical Correspondence School is not the sole educational agency providing for the needs of a small group. Apprentices in some of the smaller trades, such as painting and decorating or automotive machining, are given block courses—typically

of three weeks' continuous full-time study once a year for each of three years—at one of the main technical colleges. The continuous instruction in the intervals between the block courses takes the form of correspondence tuition or, sometimes, correspondence tuition for the majority and classes for the few who live near enough to others in like case to form one or more evening classes. At one time the correspondence teachers took part in the teaching of block course students at the Central Technical College, where many of the block courses are conducted, but this practice has now been discontinued. Instead, the students are borrowed for half a day during the three weeks and transported by bus to the Correspondence School building. The arrangement, which works very well, is made possible by the fact that the two schools are only about twelve miles apart.

The provision of courses that are alternative to evening classes typifies the second main purpose of the Technical Correspondence School. It is to fill the gaps left in the geographic coverage of the country when the other schools have catered for all the students who require a particular course and who live within their catchment areas. The pattern is illustrated by the electrical trade. Classes are available in twenty-five centres, but that leaves about 16 per cent of the apprentices without a class within reasonable travelling distance. These so-called country apprentices attend block courses and study by correspondence in the intervals. The electrical apprentices who attend evening classes only and cannot reach a centre where Saturday morning or weekday classes are available are also treated as country residents and attend the block courses. That, however, leads to considerations that are beyond the scope of this article.

Importance of Rural Education

In a land of relatively small towns widely spaced it is not surprising to find that country students are numerous. About two apprentices in every five are trained by the Technical Correspondence School. Generally speaking, there is no problem in deciding whether a student is eligible to enrol with the Technical Correspondence School. The rule is that if transport facilities are such that he can attend a live class he must do so unless by reason of shift work, which is not common in New Zealand, unusual hours or conditions of employment, or physical disability he needs special consideration. This rule has acquired a new importance since the school began to develop courses in industrial management and business administration. The typical student in these courses is a married man with a young family whose domestic responsibilities, particularly in these 'do-it-yourself' days, are so heavy that he is often very reluctant to attend two or three evening classes a week.

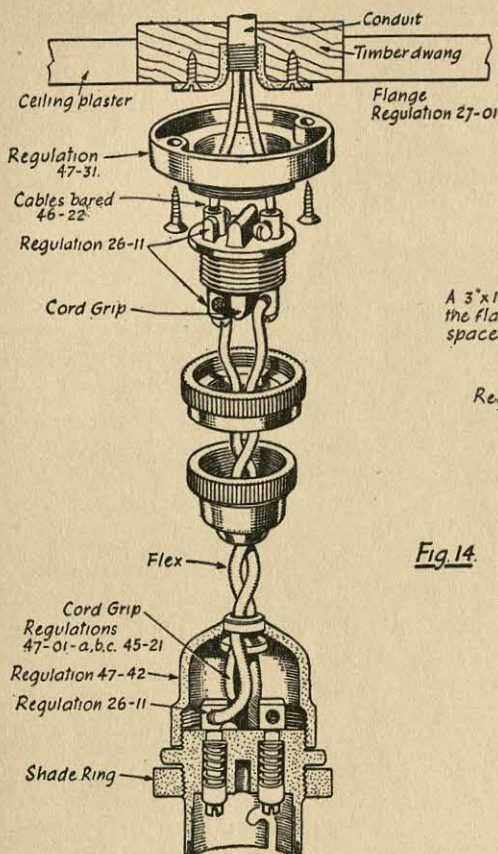
He is apt to claim that the rule bears harshly upon him, and it may well be that some relaxation is needed in his case.

Despite the inherent limitations of study by correspondence the results achieved by correspondence students in the examinations run by the Trades Certification Board are consistently above the national averages. The reasons for the effectiveness of the Technical Correspondence School—except to the extent that results are affected by the observed tendency for country apprentices to be more studious and more interested in their work than are town boys—must lie in the methods it uses.

The material of the lessons is divided into assignments, each including as much work as is expected to keep a student occupied for three weeks at the rate of two to three hours a week. A course normally consists of two or three subjects, so that the total study time required each week varies from four to nine hours, the average being six hours.

Each assignment includes questions of two types: practice exercises, to which a full solution is given elsewhere in the same assignment, and test papers to which model answers are sent when the marked work of a student is returned to him. Here, then, is one of the first reasons for the success of the students in examinations; they have ample practice throughout the course in answering examination questions. A student may cheat if he wishes, but he cheats only himself, and in practice the number of cases in which work has shown evidence of direct copying from model answers is negligibly small. The marking service is a personal one. The scripts are individually marked, and as far as possible the same teacher marks any one subject throughout the year. With the returned scripts he sends a handwritten letter, and students are invited to tell him about any special difficulties they may experience or about any other topic of mutual interest that is relevant to the course of study. Moreover, each student is under the special care of one teacher who, acting as a course supervisor, watches his general progress. The supervisor does this by noting the comments of the two or three teachers who see the student's work regularly, and by satisfying himself that the student completes assignments at a reasonable rate. He also ensures that the student knows about the mechanics of entry to the examinations he should sit.

Originally all assignments were in cyclostyled form, but more recently increasing use has been made of an offset process which reduces the size of typed sheets and allows them to be assembled in booklet form. Extensive use is made of illustrations and diagrams, not only as a teaching aid but to lighten the appearance of the text, and very great care is taken in their production. The school employs illustrators who, working from sketches made by the author of an assignment or

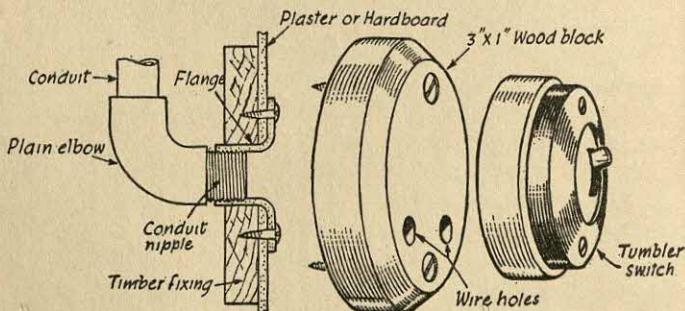


Regulation 47-03

A 3"x1" Wood Block must be used between the flange and the ceiling rose if ample space for connections is not available.

Regulation 47-02(1),(2) or 27-02
Shades etc.

Fig. 14.



Typical diagram in the course material for electrical apprentices.

from diagrams or photographs selected by him, prepare illustrations of a uniform and high standard. By using the techniques of the cut-away and the exploded view, and by judicious selection and simplification, the illustrators are able to produce a result that is almost always much more effective as a teaching device than is a photograph, and for that reason photographs are seldom used in assignments. (See p. 514.)

The third principal function of the Technical Correspondence School is the production of textbooks. There are very few trade textbooks published in New Zealand, and teachers have necessarily had to rely mainly on texts written for the United Kingdom market. While many of these are excellent, the trade practices they describe are often significantly different from those employed in New Zealand. In that country, for example, a builder is a carpenter, an electrician has to be familiar with a system called "multiple earthed neutral", and many of the cars and trucks that a motor apprentice must learn to service are made in North America.

The Technical Correspondence School is well placed to prepare textbooks suited to local conditions, because much of the necessary material already exists in the assignments. Moreover, it stands to benefit when the books have been produced, because the related assignments can then be rewritten in the form of a supplement to and a commentary on the text. Once they are cast into that form they can be much shorter and therefore more easily kept up to date. There is a further incidental advantage in that the material incorporated in the textbooks is thoroughly revised during its preparation by submitting it to representatives of the trade concerned. Care is taken to see that these readers are well distributed geographically, because trade practices and even nomenclatures vary somewhat from one end of the country to the other, especially in a trade such as building, in which customs are influenced by climatic differences, which are marked, as well as by the local availability of materials. The checking process has, however, been found to be inordinately slow, and the next textbook will probably be issued to students in booklet form and used as a study text for a trial period before it is placed on the market.

One other unusual feature of the school that is worth a mention is the way in which it conducts internal examinations on an honour system. The candidate receives his paper in a sealed envelope and is trusted to answer it under examination conditions at a time convenient to himself within a specified period of three or four days. A signed statement from the student to the effect that he has done this and has not taken longer than the prescribed time accompanies the script. This system has been applied so far only to the internal examinations for the New Zealand Certificate in Engineering, which is a course resembling

a limited public. These are the *Service Cinématographique de l'Enseignement Technique*, and the *Service Cinématographique du Haut-Commissariat à la jeunesse et aux Sports*.

On the regional scale, two types of establishment exist. *Centres Régionaux de Documentation Pédagogique* and the *Centres Départementaux de Documentation Pédagogique*. They have many functions corresponding, on a regional scale, to those of the *Institut Pédagogique National*. Thus the regional centres for teaching aids possess among others an audio-visual service. It is the task of those working for this service to organize the distribution of educational films to schools in their own region. This service helps the central services in the production on a regional scale of audio-visual aids of all sorts; filmstrips, films, slides, radio and television programmes, etc. Most of these regional centres possess workshops in which they can repair and maintain the audio-visual material bought by the schools. The centres organize practical introductory courses on the handling and use of audio-visual aids. At the present time there are in existence thirteen regional centres, and it is planned to establish a regional centre in each of the seventeen French university districts.

The policy of the Ministry of Education has been constantly to try to make new methods of teaching more easily available to those who make use of them; to this end it has taken the initiative in setting up *Centres Départementaux de Documentation Pédagogique* in the ninety French *départements*. Some twenty-eight *départements* already possess such a centre. Their functions in the audio-visual realm are the same as those of the regional centre, but are destined for a single *département* and not for a group of these units.

At every stage those who make use of these aids are thus consulted and listened to; there is a twofold advantage to be found in this procedure: it provides a democratic system of consultation of the users and makes possible planning on a national scale for production and distribution of audio-visual aids.

Indeed, these opportunities for planning, this continuous consultation between those who make use of these aids and make requests and suggestions and those who know what technical and financial resources the central administration has at its disposal, probably forms the unique contribution of the French organizations to the use of audio-visual aids in schools when compared with other countries.

Audio-Visual Equipment

The schools of France may be divided into two main categories. First, those in which an elementary education is given (*premier degré*) and which are equipped mainly at the expense of the local authority;

secondly, establishments for secondary or advanced education, where expenses are met by means of grants or loans from the central authority.

Since schools providing elementary education are maintained and equipped by local authorities the amount and quality of audio-visual equipment has a tendency to vary according to the wealth and financial resources of these authorities. Under recent legislation¹ the state schools received grants at the rate of 3,000 francs per pupil per year. This money, originally meant only for the equipment of schools, can now also be used for their maintenance; but it made possible the adequate equipment of many elementary schools.

The authorities responsible for the institutions in which secondary, technical, and advanced education is given provide audio-visual equipment for these schools. Two ways of providing this equipment are in use: sometimes the central authorities make a group purchase of a large number of pieces of equipment of the same type and then share them out among the different schools; sometimes they make available to schools grants which are used by them for the purchase of whatever equipment they need.

The latter method is generally preferred because it is more flexible than the former, and allows the heads of schools to acquire equipment complementary to that which they already possess.

As a result of these arrangements, the amount of audio-visual equipment in French schools is estimated to be about 100,000 filmstrips and slide projectors, 50,000 record players, 10,000 sound film projectors, 8,000 radio sets, and 4,000 television sets. These numbers of pieces of equipment are far from sufficient, considering the number of schools. Further, the equipment varies a great deal from one school to another.

The Training of Teachers

Those intending to become teachers in elementary schools are trained in the *Écoles Normales*; those who wish to teach more advanced work receive their training in *Centres Pédagogiques Régionaux* and in *Instituts de Préparation à l'Enseignement du Second Degré* for the more advanced types of work. Instruction is given to intending teachers on the use of audio-visual techniques. These classes are accompanied by model lessons and practical work. This training, which is not yet compulsory, is not a regular part of the general course everywhere, but varies with different institutions and centres. But in many centres and *Écoles Normales*, for lack of sufficiently well-trained lecturers, the

¹ The Barangé Law.

the British National Certificate courses. At two points in the five-year course there are external examinations, which the students must sit under normal control. These provide a check on the honour system, and there has so far been no reason to suppose that it is abused.

Such, then, in outline is the way in which an unusual school has tackled a difficult problem. In doing so, it has developed techniques that enable the teachers to give to students a service that need fear no comparison with normal classroom teaching. Indeed, the correspondence student has certain advantages not always enjoyed by students in live classes. If he is to make progress at all, he must form good study habits. He must learn to concentrate and to discipline himself; to read purposefully and to think about what he reads. He discovers how to use reference books, how to check his own work against model solutions, and perhaps, above all, how to marshal his thoughts into a logical sequence and express them so that they can be understood.

The Technical Correspondence School is undoubtedly an effective educational instrument in its own right, particularly suited to the needs of a country with a small and scattered population. It forms an indispensable part of the technical education system in New Zealand and, in conjunction with the provision of block courses, goes far to provide the equal educational opportunity for all, town and country folk alike, that is an essential part of the New Zealander's philosophy of education.

BERNARD C. LEE.

CHAPTER SEVEN

The New Zealand School Publications Branch

THERE are 2,870 schools in New Zealand. They vary from the remote, sole-charge primary school with its single classroom to the city post-primary school which provides a wide choice of courses for its eight or nine hundred pupils. The work of all these schools is based on a national curriculum, primary and post-primary, prescribed by the central Department of Education. This has been so since 1877 when the Education Act of that year gave New Zealand her national system of free, secular, and compulsory education. The first administrators were determined to establish scholastic standards at least as high as those of the primary schools of England and Scotland—this was to be no 'colonial' curriculum—but the influences in a new country were such that they endeavoured at the same time to make their curriculum as broad as possible. In the successive revisions of the curriculum since 1877 there has been an increasing emphasis on the all-round development of children and on active ways of learning.

Since the 1930's teachers have played an important part in the framing of the school syllabuses. Teachers' representatives sit with officers of the Department on the various syllabus revision committees. the proposed new syllabuses are published and distributed to all teachers in the country for criticism, and the committee examines their comments, and often considerably revises the original report according to their suggestions. Beyond laying down minimum subject prescriptions, the national syllabuses are designed to give teachers a wide freedom in their interpretation; but the Department of Education has always believed that it should take some responsibility in helping teachers to work within the curriculum, and has been concerned from an early stage with the provision of textbooks and teaching aids. When, in 1935, Peter Fraser became the first Labour Minister of Education, one of his many proposed educational reforms was the provision of new textbooks for New Zealand children, which he hoped would do much in bringing about "a changed spirit" in the schools. A direct result of this was the establishment in 1939 of the School Publications Branch, which has functioned within the Department of Education but which has so maintained contact with teachers and children that the development and expansion of its work has always been directly stimulated by the education system it serves.

In 1939 the School Publications Branch had a staff of three. Now, after nearly twenty-one years, it has a staff of twenty-one. The editor of the Branch is assisted by an editorial staff of seven (each of whom is editor in his own right of a particular publication), and there is an editorial assistant who is also Branch librarian and proof-reader. There is a production staff of four: the art editor (whose position is second to that of the editor), his two assistants (who design the publications they work on with the same freedom as that given to individual editors), and a staff artist who also has considerable choice in the illustrations she undertakes. (Some of the illustration of the school publications is done also by the assistant art editors; most of it by outside artists, working on commission.) There is a clerical staff of seven: a section officer who with two assistants is responsible for the general clerical work of the Branch (preparing estimates of expenditure, checking financial authorities, supervising despatch, etc.); a clerk who acts as editor of the administrative circular, the *Education Gazette*; a distribution and filing clerk; and two typists.

The Branch is responsible for the publications, listed on p. 519, which are distributed free to all schools in the country.

By overseas standards these figures are comparatively small, but the School Publications Branch is one of the largest publishers in New Zealand. Most of the printing is done by the Government Printer; a private firm prints the publications for Island Schools and an occasional textbook under contract to the Government Printer.

In 1939, when the Branch began, the extent of its activities was much smaller. There already existed the *School Journal*, which had been published for primary schools in three graded parts since 1907, and the *Education Gazette*, the Department's fortnightly administrative circular established in 1921 to advertise teaching vacancies and appointments. In 1939 the first plans for the School Publications Branch included the production of a series of primary school textbooks on arithmetic and English, and some work was done in the first years on a graded series of school readers and primary textbooks in history and geography.

The Problem of Textbooks

During the 1930's educational thinking in New Zealand had been characterized by an increasingly critical self-awareness and a developing sense of nationality which had been fostered during the uneasy years of the depression and was to grow very rapidly during the years of the Second World War. The dissatisfaction with the traditional methods of academic education, the new sense of purpose and (sometimes vague) idealism came, as much from the teachers themselves as

REGULAR PUBLICATIONS

<i>Name of Publication</i>	<i>Issues per Annum</i>	<i>Pages per Issue</i>	<i>Number Printed</i>
EDUCATION GAZETTE	23	20	7,000
SCHOOL JOURNAL:			
Part 1	6	32	36,500
Part 2	6	32	37,000
Part 3	4	72	44,500
Part 4	4	72	46,500
LARGE JOURNALS FOR PARTIALLY-SIGHTED CHILDREN:			
Parts 1 and 2	6	32	60
ISLAND JOURNALS:			
Samoa	6	24	12,000
Cook	6	16	3,000
Niue	6	16	2,000
Tokelau	2	16	500
PRIMARY SCHOOL BULLETINS	5	32-48	29,000
POST-PRIMARY SCHOOL BULLETINS	10	32-40	24,000
BROADCASTS TO SCHOOLS:			
<i>Teachers' Booklets:</i>			
(1) Music	1	48	6,500
(2) Junior Song Book	1	32	7,000
(3) Broadcast Notes for Teachers	3	24-36	7,000
<i>Pupils' Booklets</i>			
(4) Music	1	32	72,500
(5) Social Studies	1	32	47,000
<i>French</i>	1 in 2 yrs	120	6,000
EDUCATION	10	32	23,000
NEXT YEAR	1	32	24,000

NON-REGULAR PUBLICATIONS

Revised syllabuses in pamphlet form	25,000 each
Publications for new settlers	2-3,000 each
Arithmetic textbooks, Books 1 to 7, for Standard I to Form II	100,000 each
Teachers' handbooks for arithmetic, nature study, physical education	5-7,000 each
Infant pictures—series of large pictures	2,500 each set
Island infant readers, in vernacular	1,000 (Niue)
	2,000 (Cook Islands)

from the leaders in education; and the new prescriptions, primary and post-primary, that were drawn up between 1935 and 1945 gave the first firm expression to the new educational ideals.

New prescriptions needed to be implemented by new textbooks. "A

vigorous programme of school publication was more than just desirable; it was central to the whole movement for educational reform."¹ It was not only because of war-time shortages of labour, paper, and machinery, and because the New Zealand market was too small to support a number of competing educational publishers, but because it seemed that the kind of publications teachers were asking for could, for a time at least, be best supplied through the concentration of the energies and experience of one central body (in this case the Department of Education) that the work was handed over to the School Publications Branch.

In 1937 a committee set up by the Minister of Education to report on textbooks then in use in primary schools had said that these books were so bad that most experienced teachers refused to use them, and the committee went on to suggest that "the first and most important step . . . was to provide books by New Zealand writers that would at an early stage in a child's life attach his mind to the incidents and objects of the local scene". The committee admitted that short of the emergence of native writers of "something like genius" this would be difficult, but it believed that much could be done by writing what was "attractive and sincere even if not inspired".

Seven years later the consultative committee appointed by the Minister of Education to consider and report on the post-primary school curriculum,² in its section on social studies, made this recommendation: "As far as reading is concerned we make a plea for the use of real books—books written by people with a story to tell or convictions to express—in contrast to the poorer type of textbook with its colourless recital of pre-digested facts."

So in 1945 the search for New Zealand writers began; but from the beginning there was no suggestion that the Department should supply all the textbooks for New Zealand schools. The post-primary schools continued to select and import their textbooks from overseas. The grants to primary schools for the provision of books for class and school libraries were continually increased. The development of the National Library Service made it possible to place loan collections of fiction and non-fiction in every school. The policy of the School Publications Branch was merely to supplement these imported books by a series of bulletins and journals and a few primary textbooks written for New Zealand children with New Zealand conditions in mind.

¹ *The New Zealand School Publications Branch, Educational Studies and Documents*, No. 25 (UNESCO, Paris, 1957).

² *The Post-Primary School Curriculum*. Report of the Committee appointed by the Minister of Education in November 1942 (New Zealand Department of Education, 1945).

For all the publications it has been our principle to look for a writer who, because of his expert knowledge of his subject, is best qualified to deal with it. We believe that it is from the quality of mind of the writer, from his enthusiasm for his subject, from his ability to see it whole and set it in perspective, that the children will ultimately get the most benefit. These qualities more than counterbalance a writer's lack of experience in writing for primary or post-primary children, but it is often necessary to help him to adapt or simplify his writing to meet their needs. It is here that the work of the editors comes in. The professional training of most of the editors of the Branch has been in teaching rather than in publishing or even in writing, and in their editing of scripts it is largely on their own experience as teachers that they depend, but it is no disadvantage that this type of work does attract teachers who have themselves some ability in writing. The members of the editorial staff who occasionally write for their own publications all find that in submitting to the discipline of writing for children they have at the same time learned more about their work as editors, and therefore have been more able to help other writers to adapt their work to the varying needs and abilities of children of various ages.

In thirteen years we may claim to have made some progress with the *Post-Primary School Bulletin*, which was first published in 1946 to provide background material on New Zealand topics not readily available elsewhere for post-primary pupils. Some of the writing in this publication has been very good, some naturally less good. The *Bulletin* has been accepted as a useful supplement to imported texts, and perhaps more importantly as an introduction to wider reading in such subjects as New Zealand history and geography, New Zealand fiction and verse, farming and factory industry, local government and parliamentary procedure, film criticism, International Geophysical Year, the National Orchestra, and the study of New Zealand plant and animal life.

But we are still experimenting rather uncertainly with the *Primary School Bulletin* established in 1948 mainly to implement the new syllabus in social studies, and as a substitute for the history and geography textbooks the Department was not by this time willing to produce. In 1948, the 'bulletin' method of publication was certainly the best one to adopt.

By producing bulletins rather than history and geography texts, we were able to get more material more quickly into the schools. We were able to work experimentally; it is easier to jettison a bulletin that is not very successful than a textbook with its much greater investment of time and money. By choosing small particular topics we were able

to present them with the almost loving elaboration of visual and human detail which may catch the imagination of a primary school child. But though the writing of a primary school text at its best is creative writing, the text of a *Primary School Bulletin* is still unavoidably a hybrid form of writing. In a few of the bulletins, writer and artist together in their story and picture presentation of a high-country farm or of the Yankee whalers in New Zealand, for instance, have achieved an excellent documentary technique. In other bulletins, through trying to present factual material in story form to under-twelves, we have fallen into the old trap of trying to teach through the words of a didactic parent, uncle, or factory foreman, who answers with exemplary patience the questions of a pair of insufferable children (deliberately male and female). Or, again, we produce a bulletin about the Maori people, very good in its way, very popular in the schools, but in which the story is episodic, the characterization is thin and flat, and the whole tends to be used mainly as a quarry for 'facts' about how the Maoris lived before the European settlement. Learning fast, we ask a novelist to write a series of bulletins giving the story of Maori life over a hundred years. These bulletins are not intended to be complete historical statements; it is better for the children to begin to understand the interplay of events and feelings than just to be able to list the facts. But sometimes the history tends to get lost in the fiction, so that the editor has to suggest stretching out or compressing a generation so that the right character is ready to take part in the right historical event at the right time. These bulletins, however, have their own value for more able children, and are particularly well received in some Maori schools. Taking all this into account, we then get a historian to deal with the European settlement. His bulletins are very well written, very carefully documented, but his history is so meticulous that sometimes his explanations are too thick for the story to come through, except for the more academic children. We decide history must be more personal, and ask a poet and short story writer of some skill to write a story about a sawmilling settlement sixty years ago. Her fictional children come to life, the setting of the story is both vivid and accurate, and the artist somehow captures the spirit of it all, but without thinking about it—until after the cover is printed—we call this bulletin *Sawmilling Yesterday*—just so that it fits into the syllabus.

This year there is to be a conference on primary school social studies, attended by teachers, inspectors of schools, and two or three of the editorial staff of School Publications; a handbook of suggestions for teachers of social studies will be discussed, and also the immediate and long-term plans for the *Primary School Bulletin*.

The "School Journal"

The most interesting of the school publications to study from the point of view of the development of the work of New Zealand writers has been the *School Journal*. It was established in 1907 as a government effort to supply at least one common text for primary schools because parents complained that moving from one district to another frequently involved buying an entirely new set of textbooks. The *Journal* has had more editors and a more varied history than the other school publications. It has been the subject of two M.A. theses in Education, and has indeed become so much a part of the texture of primary school education in New Zealand that there are few adults that cannot remember some odd facts about termites or whaling—once recurrent topics—or quote "Beside the ungathered rice he lay, his sickle in his hand", which they first read in the pages of the *Journal*.

The *Journal* has had its heavily didactic phase, its strongly patriotic phase—particularly during the First World War. It was for a long time the staple reading in the primary school; it was also the recognized vehicle for moral propaganda, and the chief source of passages for parsing and analysis, dictation and spelling. It was subject during the 40's, and still is occasionally, to the arguments for and against a meticulously graded reading vocabulary. It is still the target of those who write to the Minister or Director of Education suggesting that a series of articles on this or that should form part of the educational background of the New Zealand primary school child.

The present editors try to produce a magazine that maintains a high standard of writing and drawing, something that children will enjoy and that may lead them on to wider and more adventurous reading. The pattern for the four parts, with differences in difficulty and length, is much the same: several stories; some verse; a play to be acted; articles on social studies, science and nature study, often illustrated with photographs; instructions for games to play or things to make; occasional book notices and short reviews.

Some of the fiction is reprinted, with the permission of the original publishers, from modern books for children, but the most important function of the *Journal* is the publication of the work of New Zealand writers. In an article in *The Author* (1958 winter issue), Geoffrey Trease refers to the children's writer as a "minor artist" in contemporary literature. "An artist's function," says Trease, "is to interpret life, and though the children's writer has certain limitations, he can still perform that function where it is most needed . . . [for] the growing boy or girl." That interpretation is difficult enough in the vague sphere we call "social studies"; it is still more difficult in the

sphere of human relationships and spiritual values. For part of that interpretation all children must depend on the story-tellers and poets of their own country.

Over the past fifteen years or so we have found in New Zealand a number of writers, both for the *Bulletin* and *Journal*, whose work has had in varying degrees the qualities of sincerity, originality, simplicity, and good writing that we look for; and this presupposes absence of any easy sentimentality, any hint of writing down for children, and absence also of a too sophisticated humour, or of coyness or whimsy. It is much easier to express these last qualities negatively, because a warm, spontaneous humour of word or character or incident is as rare in writing for children in New Zealand as it is elsewhere.

Since 1945 our fiction writers have tended to fall into several main groups. We had our first response from teachers in remote Maori schools, who early realized the need of the Maori children for something written especially for them. Since then teachers have contributed steadily to the *Journal*; there are one or two whose inventiveness has not failed over the years, but most of them have succeeded in producing only one good story, which means that they have happened on only one good plot. Parents also have contributed stories, written first for their own children. Therefore we have had fantasies that were worked out as bedtime stories, a serial first posted chapter by chapter to a child in hospital, stories written in response to the demand "tell me about when you were little", and nicely exaggerated accounts of camping and fishing and yachting all over the country.

Possibly our 'grandfathers' tales' were the most interesting to edit. There was one serial story of a boy at school in a New Zealand bush town of the 90's. He was a satisfactorily Tom Sawyer type of character, and the descriptions of school, of playing truant, of fishing expeditions, and of a forest fire were rich with vividly remembered detail. Another writer—from the Cook Islands—gave us a day-to-day description of the life of a family of Island children, their food, their houses, their minor adventures of the reef. This had been the writer's background for over half a century; he made it real, and New Zealand children so closely identified themselves with the children of the story that later in the year when the orange crop failed and newspapers carried accounts of the hardships the Islanders faced, it was hard to convince the children in some New Zealand schools that they could not send food or money to the actual family they had known so well in the *Journal*. A third grandfather wrote of his own childhood in a frontier post at the end of the Maori Wars. He was a man who wrote and illustrated in the manner of the nineteenth century, but he remembered details, such as how the Maoris set snares for birds, which other

writers and artists would spend days checking in museums and libraries. Although these three men tended to write in a leisurely, even garrulous, style that children to-day will not suffer gladly, there was a clear, direct thread of narrative and description running through it all, so that editing that was largely pruning, and sometimes re-ordering, would produce a vital prose that children by and large accepted on its own merits.

We have tried also to convince the few more or less established writers in New Zealand that writing for children is something worth trying. All of them, having accepted a commission, have been good enough craftsmen to take their work very seriously indeed, and editing with them became a matter of serious discussion over a comma or an emphasis—no more “do what you like with it, I won’t mind”. Several of these writers have produced work of some distinction, though one or two of them naturally have succeeded in interesting only the more imaginative children—but we have always held that it is good occasionally to publish this kind of writing.

Usually we have had to publish New Zealand fiction in serial form; it is easier to write a novel for children, however episodic it may be, than to write a good short story. And most of the stories are worked out in terms of ‘adventure’, credible or incredible, rather than in terms of human character and everyday incident. But it is the job of a children’s editor to continue to look for the writer who can give at least momentary significance to everyday experience, and who can extend children’s imaginative realization of this common experience beyond their own school and neighbourhood, finally beyond their own country to the rest of the world.

The Importance of Good Presentation

For any publisher the first problem is to find a writer, but the text is only the first stage; it has to be presented. Illustrating a story or a teaching text may be even more difficult than writing it, and the interpretative role of the artist is as important as that of the writer. We have sometimes been able to work satisfactorily with an inexperienced writer who yet has something to say, but not with an inexperienced artist who lacks the essential training that enables him to translate what he wants to say into line. In the work of our artists we look for the same qualities of sincerity and spontaneity as in the work of our writers; but the artists have to submit not only to the discipline of their medium and the limitations of working for children, they must accept also the discipline of interpreting another’s work. Good drawings extend the text that they illustrate—if they make independent comment it must be the right kind of comment. A skilled and inventive

artist can illuminate a story, a poem, an instructional text; the work of a pedestrian artist can dull a child's own imaginative vision.

But the artist is still only one more of the group of people responsible for the production of a publication, a group that begins with the writer and editor and includes the designer of the book—who commissions the illustrations and cover, decides on the paper and type, and supervises the production at every stage, but who cannot do his work well without the skilled help of the blockmaker and printer. Something can go wrong at every stage of publishing, and the School Publications Branch must be steadily committed to a constant effort to maintain and improve standards of production as far as it can.

Publishing Problems

Many of these problems will be familiar to anyone concerned with publishing for children. There are other particular problems that an editor of publications produced by a government department must face. The first is that, perhaps because his readers are more or less captive and because his books are not freely selected by teachers, he is expected automatically to satisfy everyone and to fulfil every demand of the education system. I remember the amused incredulity of some teachers in London when they heard that New Zealand teachers often vigorously criticized the *School Journal* and *Bulletin*—why criticize a free gift? But to us in School Publications, constructive criticism from teachers is part of the positive contribution they make to the work of the Branch. Many of these teachers have helped to frame the syllabuses of instruction, and they are rightly critical of publications designed to implement it. It is the editor's job to keep this criticism in proportion, to let it be a guide and not a directive. The few efforts we have made to work directly with committees of teachers on the detailed production of a publication have been useful but not completely successful. We have learned that we cannot at any stage hand over our editorial initiative, and we have also, in time, been able to convince teachers that we cannot hand over a bulletin script, for instance, that may or may not be too difficult for fifth forms, to be rewritten by a committee of fifth-form teachers and expect to retain any of the original quality or value of the work. What we must do is to keep up a consultative relationship—with children as far as this is possible without going back to work with them in a classroom over a long period; with teachers through occasional articles in the magazine *Education*, through their in-service training courses where the school publications are sometimes considered, and through discussion wherever we can find it with inspectors of schools, school staffs, and individual teachers.

There is another more arguable problem for a departmental editor to face. In his introduction to the UNESCO study on the School Publications Branch, the Director wrote: "A publication produced by a government department is peculiarly vulnerable to public criticism. An apparently harmless phrase in a school book may offend a large section of the community or may bring the whole publication into the realm of politics." This kind of thing is often used as an argument against government publication of textbooks; I think that there are arguments against government publication for schools, but that this can be one of the least important. In practice we have found that the 'censorship' the Department of Education imposes on us no more limiting than that any group of people must submit to if they are concerned with publishing books for children. The true limitation is imposed by the age and the inexperience of the children themselves; and each editor in planning his publication is keenly aware of his responsibilities to the children who read it and to the teachers who use it in their classrooms. Therefore he himself refuses the slanted text, the propaganda, however well-intentioned, that the children are not mature enough to assess for themselves.

But this is not to say that an editor or writer does not occasionally want to be controversial, particularly for teachers and older children. Therefore in School Publications we do allow a script to go—not as far as we dare, but rather as far as we personally believe it should go. This is possible because we are working within an education system which has, notwithstanding its national syllabus, a firm tradition of professional freedom. The staff of School Publications have the same freedom to work creatively on their publications as the teachers have to work in their classrooms, and we hand on to the writers we choose the same freedom—for, indeed, they are not people to submit willingly to any rigorous censorship of their work. It is for readers to judge finally whether or not the school publications show signs of having been published by a government department.

We have also in School Publications the freedom of not having to sell our work. There is an advantage in not being concerned about the possible immediate commercial attractiveness of a publication, which makes it possible to work more experimentally than we could do otherwise, realizing that while teachers and children may not always accept a publication gladly at first, they may well after they have tried it out over a year or so come to value it more than a publication with a more conventional approach to its subject.

Earlier in this article I suggested that if we were to have the kind of publications that teachers were asking for it seemed best for a time at least that these should be produced through the concentration of the

energies and experience of one central body. Since 1945, when the *Bulletin* was first planned, conditions in New Zealand have changed greatly—for one thing the total school population has increased by 72 per cent. Since 1945, the Director's "vigorous programme of publications" has progressed a certain distance; it has been to some extent successful; but teachers are conscious of the slowness of the progress and of the gaps in it that have yet to be filled with the type of texts that cannot be imported. Now other publishers in New Zealand are capable of producing and eager to publish these New Zealand texts.

The Department of Education has never wanted to monopolize the educational publishing market, and our relationships with other publishers have been good. There is often personal discussion of common problems, for there are few enough editors in New Zealand for us not to welcome any opportunity for good professional talk. But our relationship with other publishers must soon be worked out on more formal lines. In a country where there is still so much to be written and published it seems wise to avoid overlapping as far as possible, to share the work to be done, and to collaborate over comparatively long-term plans. We are pleased, for example, that an English publisher is now to bring out a primary school history of New Zealand, which we ourselves were unwilling to do. Some of our inspectors of schools have read the text of this book at various stages and recommend it strongly. The book itself refers to particular *Primary School Bulletins* where these are relevant. But possibly this book also will be more valuable when teachers are able to select it because they prefer it to several similar histories. There will be for a number of years a large and interesting field of publication for the Department to work in, but we feel that the Department must also consciously work towards increasing co-operation with outside publishers so that finally New Zealand teachers will have, as all teachers need, a very wide choice of publication to work from in all subjects of the curriculum. There is still too little serious reviewing of educational texts in New Zealand; one reason for this is that, as far as our own writing is concerned, we are just beginning to develop our own standards of criticism.

P. M. HATTAWAY.

The Use of Radio in Education in India

IN Asia and Africa, the recently created republics are facing major problems of educational expansion and reconstruction. The task is twofold: first, to provide enough schools and colleges for an ever-increasing number of pupils and, second, to educate the innumerable illiterate adults who have overnight become the masters of democracy. The acute dearth of school buildings, efficiently trained teachers, up-to-date textbooks, and other traditional tools have naturally directed the attention of both the educators and the government to modern media of communication. The educational value of such aids is appreciated more and more. Another important factor in this shift of interest is the change in educational aims. The objective of educational expansion is not only to acquaint each child with the three R's, or to train a selected few to help run the government, but to provide equal opportunity for all according to age, ability, and aptitude. This aim implies a multiplicity of teaching subjects and gives rise to overcrowded syllabuses. To meet this situation successfully the use of mass media of communication in schools and adult education centres is imperative, especially in rural areas.

In principle, at least, audio-visual aids are as old as history. In India particularly, architectural monuments, frescoes and paintings, calligraphy, folk drama, and art have been traditional media of mass education. For political and other reasons dependent India, like other nations of Asia and Africa, lagged far behind in the development and use of new media. After independence, to meet the challenge of mass education, the Union Ministry of Education constituted a National Board for Audio-Visual Education in 1953. Now a National Institute of Audio-Visual Education has been set up at Delhi. At the state level, the governments are setting up boards or committees on audio-visual education. Several services have been established. There is a central film library in Delhi, and state governments have their own film libraries and film vans. The community development centres have been supplied with film projectors for use in their areas. Gradually, teachers are making more use of films to supplement their classroom teaching.

A shortage of projectors, a lack of home-produced films, and a

dearth of trained teachers, technical personnel and educational film producers have, however, restricted the impact of the film in education.

Both the Union Ministry of Education and the Ministry of Information and Broadcasting are doing their best, within the limits of the funds available, to meet the needs of the schools. The film division of the Ministry of Education produces a fixed number of teaching films every year specifically for use either in classroom or for adult education. Similarly, the Ministry of Education, in co-operation with the Technical Co-operation Mission of America and other film-producing agencies, produces films, filmstrips, and charts on selected educational topics.

It is, however, with the use of radio in education that this article is primarily concerned.

School Broadcasting

Educational broadcasting has existed in India since January 1929. Even before All-India Radio existed, the Madras Corporation had a transmitter and put out programmes for primary schools. In 1939, however, AIR stations were asked to prepare, in collaboration with the state educational authorities, school programme schedules. Now twenty-two of the twenty-seven AIR stations broadcast to secondary schools. Only the Madras station caters also for primary schools. These programmes are meant for classroom listening under the guidance of the teacher.

A consultative panel, consisting of representatives of the education departments, the training colleges, the local education authorities, the listening schools, and the teachers' association, together with prominent educationists, is attached to each of the AIR stations broadcasting to schools. The chief function of this body is to advise the station on school broadcasting problems in general and on programme planning in particular. It is being gradually realized that it would make the programmes more useful and effective if teachers were given a greater share in planning them. It is now proposed to organize planning sub-committees of trained and experienced teachers. These sub-committees will recommend possible series of programmes for particular subjects or groups of subjects; for instance programme-planning sub-committees for language broadcasts, for social studies, science, fine arts, and so on.

Aims and Content

School broadcasts aim to supplement the work of the teachers by creating learning situations—to arouse the interest of the listener in the topic to be dealt with, and to hold his attention; to widen the out-

look of students by bringing the outside world into the classroom; to keep the students informed of national and international events and the teachers abreast of the methodology and philosophy of education; and, finally, to enable all students to benefit equally from expert teachers.

With the above aims in mind, the contents of broadcast series can be classified under five main heads :

(1) Broadcasts calculated to supplement the regular work of the class and to cover such ground as the students might find in their assigned reading; e.g. in illustrating the work of writers of repute, the participants discuss general principles of writing essays, letters, and so on. Stories (*Today's Story*), one-act plays, etc., prescribed in the textbooks are dramatized. Historical features (*Gupta Golden Period*) aim to depict the achievements and events of the period.

(2) Some broadcasts are designed to extend the child's experience to subject-matter beyond the teacher's experience or outside the normal curriculum. Travel talks; radio reports on outstanding events like the President's Address to both Houses of Parliament; commentaries on a cricket match; interviews with outstanding players, musicians, artists, foreign tourists, and experts; and talks or discussions on current affairs are examples of this type.

(3) Other broadcasts aim at the creation of an awareness of national developments, the cultural heritage, literature, and so on. One series highlights various projects designed to increase national prosperity and raise the level of rural life.

(4) There are also student-participation programmes. Quizzes, *School Magazine*, and *School Calling* are devised and presented by students and teachers of listening schools. These programmes are proving very popular, as they offer to students opportunities of exhibiting their talent; indirectly the programmes train them in the arts of radio script-writing and speaking.

(5) In the programmes for teachers, ideal lessons demonstrate good teaching and new methods; talks and discussions on educational philosophy are among the salient features of these programmes. In countries like India, where the school curriculum is uniform and there is a dearth of trained teachers, such programmes are of great value.

Installation and Maintenance of Receiving Equipment

Although a school-broadcasting system has existed in India for over two decades, the number of schools equipped with a radio is very small. All-India Radio provides the programmes; installation and maintenance of sets in schools is the responsibility of the state governments. In this connexion states have followed one of several policies.

(1) The purchase of listening equipment has been declared an approved item of expenditure (Bombay State).

(2) The heads of the institutions have been allowed to purchase receiving equipment from the school special fund (Delhi and Rajasthan).

(3) The state education department purchases a few sets every year and distributes them to government schools (Rajasthan).

(4) The information or social education department, which installs and maintains rural community sets, loans sets to schools and maintains them (Uttar Pradesh).

Utilization

It has been said, "The broadcast is only the central part of an educational project having three parts: the preface, the broadcast, and the follow-up. The preface is to introduce children to the subject to be discussed on the radio; the follow-up activities aim at amplification, supplementation or recapitulation." AIR has taken certain steps to enable the teacher to use these programmes successfully.

A yearly programme pamphlet for teachers enables the school to plan its listening schedule. AIR sends a printed copy of the programme pamphlet in advance to teachers. Details about the dates, time, and scope of the subject-matter are given in this pamphlet. It is expected that at the beginning of each session, before the school time-table is framed, the teachers may decide what series they wish to use so that the schools might provide appropriate listening periods in the time-table.

Until recently, AIR used to bring out pamphlets giving a few illustrations solely for the teachers' use in pre- and post-broadcast activities. It was felt that for the full understanding and appreciation of the programmes by the students, richly illustrated pamphlets were necessary. The main hurdle was finance. To meet this financial difficulty, AIR decided to organize the "School Broadcasts Listeners' League". Membership of the League is open to schools on payment of an annual fee of Rs.10. One of the main functions of the League is to produce folders, pamphlets, picture cards, filmstrips, and other visual aids.

Because of a satisfactory response from listening schools, in 1959 the Jaipur station of AIR brought out richly illustrated pamphlets for students for the following series: (1) *Travel Talks*; (2) *The Human Machine*; (3) *The Evolution of Life*, and (4) *Rajasthani Arts and Crafts*.

Usually a school lesson period lasts thirty-five to forty minutes. To enable the teachers to conduct pre- and post-broadcast activities, the broadcast lasts only twenty minutes, and usually only one topic is treated each day. Some stations put out programmes for half an hour and present two items. The argument is that the classes can select one

or the other, so that if there is a public address system some classes may listen to one topic and others to the second.

Teachers' Training

Radio is an educational aid, and its effectiveness depends entirely on the willingness of the teacher to utilize it. However excellent and educative the broadcast may be, its value would be negligible if teachers fail to appreciate its role in making the learning experience of pupils more meaningful. For training in the use of radio, the right place is a teachers' training college. Since about 1956 AIR organized one-week courses in 'Radio in Education' at the training colleges. Besides lectures and playbacks of school programme recordings, demonstration lessons for handling the receiving equipment and for conducting pre- and post-broadcast activities in the classroom are held.

State departments of audio-visual education also conduct short courses to acquaint teachers with methods of preparing and using different aids. In addition, some training colleges arrange special tutorials in audio-visual education for the Bachelor of Education candidates.

Assessment of School Broadcasts

Constant research to assess the effectiveness of the programmes and to discover the needs and interests of the students and teachers is essential in order to build up this service. Teachers of the listening schools are requested to send in a report on the day's broadcast, including reactions to the programmes together with their suggestions. Members of the school broadcasting section also visit listening schools from time to time.

"To be heard a broadcast needs to display excellence both as an educational incident and as a work of art which justifies its interruption of class routine."¹

To improve the quality of the programmes, stations always pass on to the central transcription service the scripts or recordings of selected programmes. All the other stations receive a comprehensive list of such programmes, and can always use them if they choose. In 1959 the Simla station of AIR started putting out school broadcasts, but there is no production unit attached to the station. All the other Hindi stations feed this service by their selected series. Another important proposal is to organize "script-writers' seminars".

Adult Education through Radio.

Since its inception, All-India Radio has been conscious of the vital role that radio can play in adult education. Until 1948 the growth of

¹ *Broadcasts to Schools* (UNESCO, Paris), pp. 16-17.

community listening was very slow. Some of the chief reasons were lack of electricity supply in the majority of the villages, non-availability of suitable personnel, the limited number of radio stations, and the low power of the transmitters. Since 1948, mainly due to rapid progress made in the expansion of AIR's medium-wave network, there has been fairly steady progress. In September 1954, in order to encourage state governments to expand community listening in rural areas, the Union Government evolved a new scheme, the object of which is to subsidize the state governments to the extent of 50 per cent of their initial expenditure on the purchase of community listening-sets. As a result, by 1959 there were more than 40,000 community sets in villages, and all the twenty-seven stations of AIR broadcast special programmes for rural listeners in forty-seven dialects, giving news, advice on hygiene, agriculture and animal husbandry as well as entertainment.

Radio Farm Forums

A significant development in rural broadcasting in India is *Radio Farm Forum* programmes. These forums are primarily discussion groups of agriculturists and are based upon the Canadian *Radio Farm Forum* programmes. At first the scheme was part of the food production drive. Naturally the need arose for an agency to maintain close and constant touch with agriculturists—to make them aware of the grave situation and to inspire them to work hard. It was also felt essential to maintain a flow of scientific information from agricultural institutions and research and experimental stations to the farmers and, conversely, to ascertain their needs.

Farm forum programmes were conceived as a means of achieving these objectives. The programmes were inaugurated on 18th September, 1949, by seven AIR stations. There were two programmes a week. So that listeners might understand the subject-matter, AIR officers and rural programme supervisors held discussions after the broadcasts.

A number of reasons—lack of co-ordinated effort on the part of AIR and adult education agencies, a dearth of trained personnel to conduct pre- and post-broadcast activities, the poor quality of programmes, the absence of listeners' participation, and so on—contributed to the difficulties of establishing these programmes satisfactorily.

In 1956 a controlled experiment to measure the effectiveness of *Radio Farm Forum* programmes was conducted in the Bombay State. This research project, financed by UNESCO, was a joint enterprise with AIR, the government of Bombay, the Tata Institute of Social Sciences, and other educational institutions. Special programme-planning sub-committees were formed; fortnightly guides for the *Farm Forum* programmes were published and special officers conducted post-broadcast

discussions. The results were sufficiently encouraging for all AIR stations to inaugurate *Radio Rural Forums* on 27th November, 1959.

Every State Government has appointed a Chief Organizer Radio Rural Forums who is mainly responsible for the organization and overall working of the Forums in the State. He will be the main link between the State Government and AIR. The Block Development Officer is responsible for forming the Forums at the local level, and will get his work done through the local Social Education Organizer.

Rural Forum Technique: The technique of the Radio Forums consists of four main ingredients: the broadcast, printed programme material, group discussion, and the reporting of the discussion findings.

The Broadcasts: The topics of the broadcasts are closely related to farming problems, and are so presented that there is scope for post broadcast discussion, for instance a discussion on co-operative farming; modern agricultural implements or the dowry system.

Printed Programme Material: For effective and regular listening it is necessary that the listeners know in advance about the topic to be discussed on Radio. For this purpose special fortnightly Bulletins giving details about the ensuing programmes are brought out by AIR. These pamphlets also include some guiding questions for the Conveners and useful reference material on the topics to be discussed.

Group Discussion: Post Broadcast Discussion is the main feature of the Forum. In the past it was observed that if a Government official or AIR representative was present and tried to conduct the discussion, the villagers did not come forward with their comments. It has now been decided that one of the literate farmers should be the convener and that members should elect a chairman from among themselves. After the programmes the members discuss the topic or undertake projects individually or collectively.

Discussion Findings: The convener of the Forum will pass on any queries raised to the broadcasting authorities who in their turn consult experts and give answers in the next programme. Thus this programme will become a two-way traffic.

Though a number of obstacles—like suitable maintenance equipment, double shifts in schools, a lack of classrooms with satisfactory acoustics, and a shortage of trained personnel to make and use successfully various audio-visual aids—hold up progress, happily teachers are enthusiastic and the central and state governments are giving every help and encouragement to government agencies and private organizations working to promote the use of radio in the schools and adult education centres in India.

NARENDRA KUMAR.

The East African Literature Bureau

THE East African Literature Bureau, one of the services administered by the East Africa High Commission, was established in 1948 after a lengthy investigation had been made by Mrs. Elspeth Huxley on behalf of the Governments of Kenya, Tanganyika, Uganda, and Zanzibar. East Africa, like many other countries to-day, is passing from a high percentage of illiteracy among its indigenous population to an increasing proportion literate in at least the language of the home or a *lingua franca*. Mrs. Huxley's report recommended that a government organization should be set up to supply the various needs for reading materials that this stage of transition demands, many of which cannot for a time be met by the normal operations of publishing firms. The kind of organization envisaged in the report was essentially one devoted to development: development to a stage where publishing firms will be able to produce most of what is needed, and governments, both central and local, will devote the necessary amount of public funds to the establishing and running of public library services. The contribution towards the provision of East African reading material already made by a number of publishers was not overlooked, and the terms of reference for the Bureau state that competition with publishers and booksellers is no part of the aims of the Bureau.

The funds for the original scheme to cover the years 1948-52 were provided by the United Kingdom Government from the Colonial Development and Welfare Fund; two supplementary schemes were paid for from the same source—one for libraries development and one for the launching of a popular magazine. Since 1952 the East African Governments have contributed an increasing share of the costs although, because of the difficult financial situation in East Africa, it has not been possible for the governments to accept expansion of that part of the Bureau which most obviously needs it, the libraries section. The present scheme ends in June 1960, and a further scheme from 1960-5 has been approved by the East African Governments and is now being considered by the Secretary of State. In addition to the funds provided for the running of the Bureau, the East African Governments contributed a capital sum of £25,000¹ to form a publishing fund. From this are paid

¹ £7 = 2.80 dollars.

all the expenses incurred in printing and publishing books and it secures the guarantees given to obtain publication of some books by commercial firms. Into this fund is paid all revenue from sales and royalties. A total of £6,000 was written off into two funds: a subsidy fund from which money is drawn to subsidize the cost of certain booklets that have to be sold below cost if their purpose in some scheme of public education is to be achieved, and an experimental fund for exploring certain possibilities in publishing for the general public. The remaining £19,000 is the capital on which the Bureau has financed its publications. From 1948 to 1958 expenditure on publishing books was £125,000 and there still remains an adequate working balance.

Scope of the Bureau's Work

The Bureau being a development organization, it has never had a large publishing staff; the present publishing staff, in addition to the Director, is only the staff artist, one book production secretary, and three African translator/readers. Its method of work has been to stimulate authorship by various means, particularly by the setting up of Literature Committees for the main languages of East Africa; emphasis, of course, is given to the stimulation of African authorship. The result has been that there has been a steady flow from off the press of sixty to eighty new books a year, in English, Swahili, and twenty-six other East African languages. Keeping in mind the veto on competition with the proper activities of publishers, books are published by the Bureau itself only when they must be produced very quickly, or at a sub-economic price, or are experimental. Where possible, it obtains publication by commercial firms, in some cases by the giving of a guarantee to take up unsold stock after a specified date.

The Bureau has launched a popular magazine in Swahili and Luganda editions; these were taken over by a newspaper publishing firm and are no longer the financial responsibility of the Bureau. An English-teaching magazine, *Arrow*, is published by the Bureau itself. This appears nine times a year and over 20,000 copies are sold of each issue.

The Bureau has established a rudimentary library service, offering libraries varying from 150 to 1,000 books to Training Colleges, Schools, Community Centres, and a postal service to individuals. Library Advisory Committees have been set up in each territory and it is hoped that before long the service begun by the Bureau will develop into a national public library in each territory, although shortage of funds will for some time delay expansion to meet the demand that is now known to exist.

The Bureau's Publications

The publications of the Bureau fall into two main groups, those produced as aids to school and adult education, and those for the general public, sales of which are not supported by any specific programme of education.

To appreciate the particular difficulties of the school publication programme, it is necessary to outline the language policies of the Education Departments. All are gradually introducing the teaching of English at progressively earlier standards in the primary schools, but there are differences in the policy on the medium of instruction at the pre-English level. Tanganyika has retained Swahili; Kenya used to use Swahili but is endeavouring to replace it in most areas with the vernaculars; Uganda abandoned the use of Swahili some years ago, and the medium there is the vernacular. Ideally, therefore, in Kenya and Uganda there should be a full range of books in every vernacular for every subject in the primary school syllabus that needs a pupil's textbook, and a wealth of literature to draw from for the teaching of the vernacular itself as a subject in the later standards. This ideal has not been reached, even for the twenty-seven East African languages in which the Bureau publishes, and they are by no means all the languages spoken in these two territories. Swahili is the only language that has a comparatively extensive literature; it has a long history as a *lingua franca* and an immense vocabulary.

The difficulty of publishing in such a variety of languages is not confined simply to getting the books written or translated. There is also the financial one, because the numbers of pupils in school in some language areas are not adequate to support a full programme of publication without either heavy subsidies or high prices for the books.

Some of the difficulty of getting the translation work done has been eased by the literature committees already referred to. In many areas the purchase of books for schools is done in bulk by education officers, or church education secretaries, or management committees. This is of great value in the East African situation, for without the firm backing for a new project that this bulk buying provides, it is difficult to see how new books in any quantity for the smaller vernaculars would appear. Bookshops are still few and far between, and if every new book had to be sold to each headmaster the promotion costs would rise formidably, and the time taken to get a new book into the schools would involve the publisher in heavy outlay with very slow return.

As education extends, and the numbers of pupils grow, and English becomes the medium of instruction from the first standard, the whole situation may change, but the Bureau has already proved to be of value

for the present generation of school pupils; its publishing activity, assisted on occasion by bulk buying, has made it possible to provide a variety of literature that would not otherwise have appeared.

Adult Education

Organized work among adults for which the Bureau publishes includes adult literacy, health education, and agriculture. Adult literacy primers have been published in Swahili, Ganda, Gishu, Teso, Lugbara, Karamojong, Kikuyu, Luo, Kamba, Kalenjin, and Meru. Although the quantity of literature in Swahili is, by comparison with other African languages, very large, special follow-up readers have been found necessary and the Bureau has already published several in this language. In the case of most other languages the publishing of follow-up material has a dubious future because of the tendency of many readers to lose interest once they can read, unless they go on to read another language, Swahili or English, which they feel has some value in relating them to the wider concerns of East Africa and the world. Some follow-up material has been published, however, in many vernaculars.

African Authorship

Although in one East African language, Swahili, epics, history, poetry, and other forms of literature were being produced even before the coming of Europeans to East Africa about a hundred years ago, most modern African readers of Swahili and vernacular books are mainly interested in practical subjects. This limits the number of imaginative works by African authors that can be published, but there are already signs of a growing interest in reading for pleasure.

Distribution

The greatest single obstacle to publishing is the scarcity of bookshops sited and staffed to sell to the African public. Although each year sees one or two additions to the number, chiefly of shops owned and managed by Churches or Missions, there are still very few. The bulk buying already mentioned as a help to publishing new books, acts against the wide development of bookshops. Most of the books sold in East Africa are for educational establishments, whose orders go, either direct or through a central buying office, to the Crown Agents or to one of the few large concerns able to handle this business economically and efficiently. Mobile bookselling has been tried, with great success as far as getting the books sold goes, but such a method of distribution is uneconomic in a country where great distances have to be covered between centres of population.

CHARLES GRANSTON RICHARDS.

Television and Popular Education—A French Experiment

At the seventh general assembly of UNESCO, held in Paris in November 1952, approval was given to a plan to carry out, with the collaboration of a member state, an experiment concerned with the use of television in the realm of adult education and, in addition, with the organization of group viewing of television programmes. The use of television for educational purposes in countries which are somewhat economically underdeveloped is hampered by the fact that people cannot afford to buy television sets. This pilot experiment is an attempt to find out exactly how effective group viewing is and to determine what subject-matter is needed in television programmes destined for adult education.

A Twofold Experiment

Following this resolution, the French Government asked UNESCO to organize the experiment in France. This proposal was gratefully accepted, for France seemed to offer ideal conditions for putting such a project into practice. The inhabitants of many villages near Paris had, of their own accord, organized themselves into 'teleclubs' for group viewing of television programmes.

Those in charge of French television had very quickly become interested in this 'teleclub' movement. During the years 1952-3 they had allowed Monsieur Roger Louis, the chief organizer of these groups, to make use of their facilities to broadcast to urban and rural viewers programmes concerned with the varied aspects of country life. These programmes were, in effect, attempts at popular education through the medium of television. So the authorities welcomed the possibility of being able to develop these efforts further, thanks to the help of UNESCO, with increased resources which would render scientific projects easier to carry out. Consequently, towards the end of 1953, Monsieur Roger Louis was asked to plan a further series of broadcasts under the auspices of UNESCO and the R.T.F. (French television).

To study the effects and results of this experiment, UNESCO had at its disposal in France a team of specialists in the psycho-sociology of leisure, ready to understand its concern that the results of this experiment should be examined fully both practically and scientifically. In fact, at the centre for sociological studies of the National Centre for Scientific Research those dealing with the psycho-sociology of leisure

attach great importance to the study of the conditions under which the major means of broadcasting were used for the advancement of popular education.

Once a week, first on Thursdays, then on Wednesdays at 9 p.m., there took place a series of thirteen experimental programmes. This was called "State of Emergency" (*Etat d'Urgence*). The central theme of this series was the modernization of rural work, its position technically and economically, and the conditions it offered its workers. The psycho-sociological inquiry was carried out along three main lines:

(1) The study of 'teleclubs', their history, their equipment, how they worked and what they meant;

(2) the analysis of the cultural possibilities of the most important broadcasts, according to the reaction they gave rise to in the teleclubs;

(3) the examination of the results obtained by "State of Emergency" in the teleclubs, the interest that viewers felt in this series, and the effects of the latter on the development of their attitude and behaviour with regard to modernization.

Lessons Learnt

What general conclusions can we draw from this French experiment?

First of all, what do we mean by "cultural possibilities" of programmes broadcast by means of television? There is a strictly didactic conception of educational television which we cannot accept *a priori*, and indeed it is questionable whether it makes use of all the subjects and all the technical devices suitable for the education of the public by means of television. So we must consider it from another point of view. Television is, above all, something indulged in during leisure hours—a form of leisure-time activity. The chief functions of recreation define both the limits and the extent of the cultural use of television. These functions are three in number: the first is that it should serve as a refreshment after the fatigue brought on by the compulsory occupations essential to daily life; secondly, it should be entertaining enough to take one's mind off these duties; lastly, it should favour the development of personality by providing a means of learning how to get more out of daily life. These functions correspond to fundamental needs and they are closely connected. A weekly programme must fulfil them all. Each programme must be planned with careful thought for all, otherwise it may be tedious, boring, or uninspiring. On the other hand even educational television, most closely concerned with the third function, must take the other two into consideration. For such programmes also wield their influence during leisure time, after school work, household chores, or professional duties. Those who make use

of television wish it to provide viewers with the freedom and pleasure which are essential to true recreation. We shall study without the limitations of prejudice the different types of broadcasts offered by a week's programme or that of a single evening. We shall find out which are the most popular items, and finally examine the possibilities they provide for putting television to an educational use in the widest sense of the term. The use of television in such a way would be shown by a group of programmes capable of inspiring in the viewers what we have called "active attitudes". This method of education through television can be most varied in character; it can show a method of doing something, a cookery demonstration, a systematic statement of what is known about some particular subject, a documentary programme explaining some important issue, or a programme recalling some great discovery or the preservation of a masterpiece. Consequently, it can be seen that we consider the cultural possibilities of television to extend over a very wide field.

The study of the attitudes of the members of the teleclubs with regard to such broadcasts assumes particular importance. The members of the teleclubs are drawn mainly from the working classes. Most of them are manual workers or smallholders; thus they are representative of the whole of a nation such as France.

The primary aim of popular education is to raise the cultural standard of such a public, of which more than 85 per cent have been unable to pursue their studies to a very advanced level. On the other hand it is here that people are found who will buy television sets when the price has come within the reach of those with modest incomes. So, because of their social position, the members of the teleclubs form, as far as television is concerned, the public of the future. Finally this public is organized into a club, to which these people come primarily as a relaxation, but where they find themselves in pleasant surroundings, with others with whom to talk and with something to help them to develop their personalities to the full. It is probable that these conditions mean that the cultural level found here is slightly higher than that of most of the other groups of similar social standing which are not organized into such associations. The level reached by teleclubs is thus a useful guide to the producer who wishes both to entertain the general public and to raise its cultural standards.

The Teleclub—a Leisure-time Activity

The teleclub is a new type of leisure-time activity. In rural districts its power of attraction is great. Although they have only been running for four years, the teleclubs have fitted in perfectly with local life. They have adapted themselves to seasonal demands, to the

different types of work, and to recreational requirements. In a short time they have acquired an influence over common action, in spite of divisions of interests and ideas which were to be found in all the villages which came within the scope of our experiment. They can provide manual workers and smallholders with many opportunities to express their personality and, for young people, they are a continuous source of relaxation and cultural progress. Thanks to them, the rural population has at its disposal a means whereby it may feel itself part of modern civilization, and thus its horizons become wider. Country people can feel less isolated from town life, especially from that of the capital. Exchange of ideas between different countries can reach them, and culture, which is reaching all classes, can spread yet further into the depths of the country.

Of course, the teleclub does not automatically meet with ideal conditions and, faced by an instrument that is so attractive and so rich in possibilities, those dealing with popular education should everywhere consider whether all the benefit which this new device could provide has, in fact, been reaped. It is not always sufficiently noticed what importance the teleclub is assuming in the general system of the organization of spare-time activities, which are a humanizing influence essential to our modern technological society. Wherever the teleclub springs up, it brings with it fundamental changes in the system of popular education as it existed in the locality. Consequently, it must be expected that in the future it will bring with it greater changes in popular education than any other leisure-time activity of a cultural nature has done before. It also brings about cultural co-operation which has shown its extraordinary dynamic strength by the way in which people have clubbed together to buy the often very expensive television set. It is also a lively centre of individual education and general exchange of views. It answers an economic need which will still for a long time be part of the lot of the masses in countries undeveloped from the technological point of view or which have suffered from wars.

It also brings a new answer to the need for community life, typical of small groups which seek a new balance between life as individuals and as members of society.

Consequently, educationists should realize quickly that this new vehicle offers them a way of reaching a wider and more varied public. Adult education, in spite of the ever-greater use of the other audio-visual aids and of the new methods connected with them, still reaches far too small a public. Very often the influence of known mass methods of spreading information is in opposition to the systematic,

but of necessity restricted, action of educationists and affects an enormous number of people. With television and teleclubs adult education has an unprecedented opportunity of reaching those for whom it is really meant. So it is clearly only right that it should use and convert to its own ends the most attractive and the most effective of the techniques of spreading knowledge. Everywhere teleclubs ought to provide popular education with a means of adapting itself to modern conditions of spreading ideas, knowledge, and culture.

We should not speak thus if we were not certain that television can not only be used for popular education but that those responsible for such education have to assume a great responsibility with regard to this new way of teaching, akin to that of Aesop, which can bring with it great good or great harm, depending on the use which is made of it. When the cinema first developed, adult education was too weak to have any influence over its development and growth. In about 1924 those in charge of adult education did not understand all that could be gained from the use of radio nor the effort they should have made to help in the education of the families who listened. Is adult education once more going to miss its opportunity, and prove unequal to its task? In that case, who or what will accomplish this work? The evil influence of television, if those who control it are not inspired by good aims and ideals, is well known. There have been a number of alarming inquiries into this subject both in the U.S.A. and in Britain. Are we going to allow bars and cafés to set the tone for the sort of television programmes to be broadcast? Are we going to allow television programmes to be shown in the homes, which put forward no high ideals, which do not develop a selective attitude in children, adolescents, or parents? Are educators going to take no interest in the plans for television? If so, this would be a mistake which could not be put right ten years from now. At this moment, immediately, those concerned with popular education should everywhere, not only in country districts, but also in the densely populated urban districts, in clubs and in schools, urge people to subscribe to purchase television sets for communal use, and form groups for educational purposes.

We have seen with "State of Emergency", for which Monsieur Roger Louis was responsible, that it is possible for the organizers of the teleclubs themselves to make use of their own ingenuity and methods in television productions which have both entertainment and cultural value. Why should not such attempts become general? In turn, should not many television directors and producers, in order to escape from the twin temptations of being too vulgar or too aesthetic, take part in the best productions concerned with popular education?

Potentialities for Experiment

The teleclubs can and should form, as those in the Department of the Aisne have in fact done, special clubs to view experimental, unorthodox presentations. In a more general way one of the greater difficulties met with by the television services is that of establishing permanent and profitable means of communication with the public. There are, it is true, the letters written by viewers, the inquiries into public opinion and the reviews written by professional critics; would it not be desirable to complete these by forming around each television transmitter a network of well chosen teleclubs which would periodically bring to the television services the fruits of the discussions of their members, both on the content and the form of the programmes? Would not these reactions be the most suitable means of revealing the true cultural demands of popular classes?

Some will object to this, saying that the programmes are not suitable for popular education. Those of our readers who have read our book and its appendices¹ cannot fail to have been struck by all that the public had to say about the extent and variety of programmes shown by the French television service, and by the quality of most of the programmes which members of the public either remembered or wished to see again.

But it is abundantly clear that the French television service, as things are, and in spite of its efforts towards quality, is far from making full use of all the cultural possibilities offered by different types of programmes for the education of all.

The analysis of the reactions of the teleclubs has led us to suggest that programmes should aim at a wider public and should at the same time be more cultural. Educational television would become more widespread by better adapting itself to the functions of recreation in modern life. Variety programmes themselves could provide a basis for cultural information; films could be used, presented, and commented on as is the practice in film societies; a more valuable use could be made of news features and of well-known performers; an introduction could be made to masterpieces, and the public taste for reading could be developed. All these aspects would come to be considered the only amusements necessary and desirable to a much greater extent than the present organization allows.

Finally, "State of Emergency" showed that it is possible to interest ordinary country people in one of the great issues of public life. Modernization, credit, co-operation, all these presented problems which no one before had thought it possible to place before members

¹ J. Dumazedier, *Television and Adult Education* (UNESCO, 1956).

of institutions for popular education in villages where such organizations existed. Experience has shown that subjects taken from everyday life are likely to interest and stimulate those whose daily life is made up of such things. "State of Emergency" gave to everyday questions the proportions of great problems. Somewhere between the deadening routine which debases our customary existence and the escapism which denies its existence there is room for popular culture founded on everyday work and leisure.

Our experimental series revealed all the possibilities to be found in programmes generally known as cultural, of giving to a large and varied public some knowledge of some great issue of the present moment. It is worthwhile to formulate with greater precision the principles which lie behind such a method. They may help producers to steer between the Scylla of aestheticism without content and the Charybdis of dogmatism without life. They can widen the path which lies open to programmes which can be both enjoyable and educational.

JOFFRE DUMAZEDIER.

*The Organization of Film and Television
in the Schools of the German Federal Republic*

IN Germany the film was introduced into the schools relatively early. The school film has developed alongside the cinema film and has undergone similar changes; on the one hand film producers have endeavoured to interest schools and school children in the film, on the other hand some teachers or groups of them were keen to make use of the previously unknown potentialities of the film for the purpose of illustration, notably in the fields of nature study, geography, ethnography, and so on. Schools and teaching staffs were on the whole rather sceptical towards the idea, and many obstacles had to be overcome. A notable step forward was made in the 1920's by the formation of Provincial Associations for the Promotion of Educational Films, and in 1934 by the establishment of a Federal Board for Educational Films.

There now exists in Germany a school film organization covering the whole of the Federal territory; since 1945 it has no longer been under Federal management, but under that of the individual *Länder*, which are responsible for all cultural activities. The Institute for Films and Pictures in Science and Education, as successor to the Federal Board for Educational Films, with headquarters in Munich since 1950, is no longer the head organization, although it still has the responsibility for the provincial educational centres and their subsidiary district educational centres (in Bavaria, for example, there are now 165) which supply educational films and other audio-visual educational aids. The task of the institute is the educational development and production of these educational aids, partly through its own resources and partly by commissioning outside private producers. In this way the Institute for Films and Pictures in Science and Education now plays an important and leading part in the supply of films to schools throughout the Federal Republic.

The actual management and the instruction of the teaching staffs in the use of films and other audio-visual aids in schools is the responsibility of the *Länder* and their educational departments and branches. Such a highly centralized directing and supervisory organization has both advantages and disadvantages. Its advantages are that the whole of the *Land* is supplied in a uniform manner with educational films, projection equipment, and accessories; that the teaching staffs are

uniformly instructed and trained; and that all types of schools (primary, secondary, and technical) are treated alike. But against these advantages there are also serious disadvantages.

Development of Film Techniques

The film undergoes continuous and rapid development: the silent film was succeeded by the sound film, the colour film, the three-dimensional film; non-inflammable films replaced the inflammable type; projectors have been improved year by year, thus rendering the equipment quickly out of date and practically useless as current models go out of production and replacement parts are no longer obtainable. These are serious obstacles, since no *Land* government has at its disposal sufficient funds to enable it to supply all its schools continuously with the most up-to-date audio-visual aids. For this reason a large proportion of German schools are to-day equipped with silent projectors and films which are often out of use and stored away, because neither teachers nor pupils show much enthusiasm for old-fashioned films and equipment.

In the case of the silent film these disadvantages might in principle be only of minor importance, since the body of German teachers are unanimously agreed that an educational film should be used to illustrate the subject-matter taught, a verbal commentary being provided by the teacher. The real drawback is not that the film is silent but that it is old-fashioned, having been produced perhaps as long as twenty or thirty years ago, and is thus no longer acceptable, from the point of view of presentation of the subject and obsolete technique, to teachers and pupils alike, since they are accustomed to see the latest super-productions in the cinema. This is where almost insuperable difficulties arise in centrally administered and directed schools, as in Germany. It is true that the wealthier cities and towns and also the privately owned schools are free to equip their educational establishments with the most up-to-date audio-visual aids, and much is being done in this respect even in the less prosperous industrial areas, but generally speaking, money is being less freely spent whenever a small outlay will meet essential requirements.

Moreover, technical equipment is not the only thing that matters. The training of teachers and their instruction in the use of audio-visual aids is the responsibility of the individual *Land* and not of the local authority and private school. No one can be sure that an enthusiastic teacher for whose use costly equipment has been provided will not sooner or later be succeeded by another teacher who may quite possibly be less interested in these methods of teaching and adopt alternative methods requiring further substantial outlay on new equipment.

Thus a centralized educational authority may resort to a general levelling down, since it is impossible to achieve a uniformly high level in all the schools as regards technical equipment and ability of the teaching staff to use films and other audio-visual aids. It is thus all the more impressive that, despite these difficulties, the pioneering spirit of earlier decades (that is, before the use of educational films was centralized) still prevails among a large body of teachers and in the leading Institute for Films and Pictures.

Uses of the Educational Film

In the Federal Republic the essential value of the educational film lies in the teaching of geography and the natural sciences (biology), though its potentialities in the teaching of physics and engineering subjects are equally obvious. The mechanical components of the inside of an engine, as also the living components of plants, animals and man, from the single cell to the most intricate cell systems, can be illustrated to the students by means of accelerated or slow-motion film techniques in a way that was not possible before the invention of the film. Much progress has been made since the first beginnings of the educational film both as regards production methods and its application to educational purposes, with the result that earlier films become quickly out of date. The development in the study of the natural sciences, for instance, has moved in the upper forms of elementary schools from purely abstract and systematic science to visual representation and concurrently to observation of local conditions; thus interest to-day, unlike earlier days, centres not so much on the morphological structure of the individual plant as on the neighbouring meadow, village pond, etc.

The social sciences have been added during the last decade to the fundamental subjects already outlined, together with experimental films in historical and religious subjects, and films for instruction in foreign languages, whose potentialities could only be utilized to the fullest extent by the combination of picture and sound.

Since the introduction into schools of the film and other audio-visual aids, the concept that they must in no circumstances replace the teacher or curtail his school activities has been fully justified, i.e. they must be used at the teacher's own discretion purely as teaching aids so as to make the subject more interesting to the pupils and easier to assimilate, without any form of slavish application of this teaching method.

A fundamental three-point rule for the use of films in schools must be: Preparation—Presentation—Explanation. Before showing the film the teacher must thoroughly familiarize himself with its content and

prepare his commentary. The showing of the film may be: silent, without spoken commentary on the part of teacher or pupils; with the teacher's commentary; with free comments on the part of the pupils; a showing of the entire film, repeated if necessary; a showing of parts of the film only; focusing attention on certain parts of special interest by stopping the film at given points; or a suitable combination of any of these alternatives. The results obtained depend on producing the best possible picture, on the commentary and subsequent discussion between teacher and pupils, and the correlation on the broadest basis of what has been seen and learned with what was already known. All educational films are supplied with a booklet of explanatory notes, which not only gives the film's contents but provides the teacher and his pupils with other useful information.

A significant feature of the post-war period is, in the author's opinion, the fact that schools and teachers have increasingly focused their interest on films, including the commercial cinema film. Frequent cinema attendances by children in their free time have made teachers increasingly conscious of the fact that it is impossible completely to isolate the children's school and out-of-school lives, that it would be of advantage to the school and in the interest of the children for the teachers to concern themselves more intimately with children's visits to the cinema and to discuss with them the films seen, drawing their attention to weak features as well as artistic merits of the particular film, and finally to avail themselves of suitable cinema films (foreign travel and customs, screen productions of Shakespeare's and other classic plays, etc.) for lessons in school. Interest in a film is, of course, stimulated outside rather than inside the school, notably in youth organizations and in the junior film clubs recently formed and run by young people themselves, or by adults (teachers, churchmen, youth leaders, and so on) who are interested both in films and young people. This has stimulated serious discussion in and out of school, formed the subject of debates, and the publication of surveys and studies on the subject of the possible use of cinema films in schools.

At first the question of commercial films for schools occupied the minds only of a few teachers who ventured into this field, but more recently it has been under consideration by educational boards and ministries of various *Länder*, though up to now there exists no co-ordinated policy or central scheme as in the case of educational films. Teachers at present receive directives from the Ministries of Education permitting them, within varying limits, to discuss and attend cinema performances with their classes, not only out-of-school hours but in certain circumstances in school time also, and to form film working parties, especially in secondary and technical schools, making it pos-

sible for the students to produce their own small film units, the cost of the equipment generally being met by the teachers and students. This provides an outlet for their initiative and pioneering spirit, and the teacher is not restricted to the equipment which is made officially available and is compulsory for all schools. It also helps to break down the sharp separation existing between the school and leisure activities of the students which the author regards as an unhealthy feature.

Television Services

There exists at present, at least officially, no television service for schools. The reason for this is to some extent the widely held view in the Federal Republic that the supply of new equipment to schools must wait until it is possible to equip, if not all the schools, at least the majority of them with TV apparatus, and this stage has not yet been reached. In comparison with Great Britain and the U.S.A., Germany still lags well behind. The Federal Republic has at the present time somewhat fewer than three million TV sets; Great Britain has about nine million, and the U.S.A. forty-eight-and-a-half million.¹ Germany at present has only one TV broadcasting system, whilst Great Britain has two, and the U.S.A. a great number of private, public, and semi-public systems. The German programmes are televised during the evening only and during the afternoon on Saturdays and Sundays; on weekdays there is a so-called 'family programme' televised between 5 and 6 in the evening. Since this family programme is intended mainly for children and young people, it does not consist solely, or even largely, of light entertainment, but brings much that is of a general knowledge and educational nature (such as reports and comments on foreign countries, do-it-yourself instructions, sports news, and so on), so that it may be said that educational television, though not school television proper, has existed for some years past in the Federal Republic.

Some thought has nevertheless, in recent years, been given to the introduction of school television. Many articles have appeared on this subject in newspapers and periodicals and the matter has frequently been discussed on radio and television. The best survey of the present position is contained in a report of the proceedings of a conference held by the Evangelical Academy for Radio and Television which was recently published under the title *School Television in Germany?* (Munich, 1959). There still exist widely divergent views as to whether school television should be introduced at all, when, and how, and there is no close agreement between teachers and broadcasting organi-

¹ *International Handbook for Radio and TV* (Hamburg, 1959).

zations whose task it will eventually be to prepare and organize a television service to schools, for which some preparatory work has already been done. The position to-day is in many ways comparable to that at the beginning of this century when the attitude of teachers was sceptical and opposed to the introduction of films into schools. Even the family television programme of to-day contains much that is of value for teaching in schools, and it would be a great pity if the material remained unused for that purpose. Apart from the educational film, there exists in the Federal Republic to-day a school radio service which is widely appreciated inside and outside the schools, and it may therefore be anticipated that within the foreseeable future a school television service will be introduced into the German schools with the advantage of the experience already gained abroad and with the co-operation of other countries.

M. KEILHACKER.

Iran—Language Teaching by Television

TELEVISION of Iran, known as T.V.I., is an independent TV station situated in the northern part of Tehran. It was officially opened by H.I.M. the Shah on Friday, October 3rd, 1958, and it has been operating daily ever since from 6 to 11 p.m. The equipment used is American R.C.A., and the transmitter is a 1957 model with a capacity ranging from one to fifteen kilowatts.

The British Council agreed to undertake the teaching of English by television twice a week, on Tuesdays and Saturdays, from 7 to 7.30 p.m. This thirty-minute programme is divided into two parts: Part I, Elementary, and Part II, Advanced—each part consisting of fifteen minutes' transmission. The programme is called "English by Television", and it first went on the screen on Saturday, October 4th, 1958. German is also taught by television, but French lessons, which ran for a short period, were discontinued.

At the time of writing (early June 1959), T.V.I. is still only eight months old, and the technical side of the television work at the station is still developing. A second studio has just been opened and has relieved the congestion which resulted from all television programmes being rehearsed and taking place in one studio.

It is, therefore, evident that with less than a year's experience the time is not yet ripe for judging the effects of television generally in Iran, let alone "English by Television", on the general public.

Television at first took the country by storm, and a considerable number of sets was sold. After a couple of months, however, there was a drop in the sales and then, as the novelty of television wore off and the public realized that it offered a regular and continuous form of entertainment, interest revived, and the sale of sets steadily mounted. By March 1st, 1959, between 12,000 and 14,000 sets had been sold.

Tehran is a rapidly developing city which appears to be undergoing Westernization and modernization at an accelerated speed. There is pride in owning a TV set.

Owing to the close Iranian family system there is much 'group' viewing in private homes, where relations and friends gather for the evening. However, as most sets are in the more wealthy homes, it is the wealthy and educated who tend to follow the language-teaching programmes.

Sets are also to be found in hotels, restaurants, cafés, bars, and radio shops. Of course, regular viewers of "English by Television" are hardly to be found in any of these places, though I have personally spoken to a taxi-driver who recognized me as one of the teachers on "English by Television" and told me that he stopped his taxi in front of a certain bar regularly on Tuesdays and Saturdays for half an hour in order to follow the English lessons. The various members of the "English by Television" team are certainly recognized in the street, at restaurants, in buses or shops, and are usually greeted by smiles and a word or two of English! This is gratifying in that it shows a genuine interest and goodwill with regard to this particular programme.

The educated, Westernized adult viewer watches "English by Television" for various reasons. If he already knows English, it enables him to keep in practice. If he has forgotten English or merely wants to 'brush it up', then the programme gives him such an opportunity. If he knows French or German and now wants to learn English, then he follows "English by Television". There is no doubt that English is at the moment the first foreign language that Iranians wish to learn, followed by German and French in that order. Many parents who wish to have their children educated in England or America actually order their children to follow the English teaching programme. The preference for English is particularly evident among school children and students. This in itself helps to give a natural popularity to "English by Television".

Television in School and Home

It is understood that the policy of the Iranian Ministry of Education is to provide TV for colleges, secondary schools and other educational centres, and some schools already have sets. (Incidentally, the University of Tehran has an internal television system which is used for specialized teaching purposes within the university. The transmitter, camera, amplifier, and six receiving sets were a gift of the German Standard Gesellschaft in 1957.) However, as the "English by Television" programme begins at 7 p.m., it is not possible for schools to benefit from it. Nevertheless, a number of teachers and students follow the programmes regularly in their own homes or in the homes of friends or relations who own television sets. The British Council is planning to organize some viewing 'groups' so that a certain number of Iranians can benefit from the television instruction under the guidance of qualified English teachers.

As for the actual number of viewers, T.V.I. estimates that in March 1959, they were as follows: Thursdays and Fridays, 140,000; other days, 30,000-90,000. (It must be remembered that Iran is a Muslim

country and that the Iranian week-end is Thursday afternoon and all day Friday.) As the population of Tehran is about two millions, this means that viewers number from 4 per cent to 7 per cent of the city's population.

As the time of the "English by Television" programme is between 7 and 7.30 p.m., the nature of the audience has to be taken into consideration. It is a busy time of the day in the house. The housewife is preparing the evening meal, her husband has probably just returned home, and the children are doing their homework. In some families, Father will encourage his children to follow "English by Television" as an additional means of improving their English. On the other hand, he may be of the opinion that such listening detracts from the school work that the child must prepare. It is not uncommon to get reports from children to the effect that they are interested in watching "English by Television", but that directly Father returns home he switches the programme off.

However, owing to the particular hour of the day, "English by Television" has to be directed to a general audience and not merely to students and school children. This means that it has to have enough variety to interest the adult and the child, the serious student and the general viewer; it has to contain enough linguistic instruction and significant action to attract the two extremes of viewer. For this reason, the actual teaching situations of the Part I Elementary programme are of everyday interest, e.g. going for a picnic, cooking in the kitchen, eating lunch at table; while the Part II Advanced programme, which is informative and cultural in a broad sense and includes a large variety of subject-matter, is planned to reach every type of viewer, serious and casual. The Part II Advanced-level programmes are broken up to permit explanations of a linguistic nature.

As a certain knowledge of English is presumed at the Advanced level, programmes include films, films with commentary, filmstrips with commentary, slides with commentary, large display stills with commentary, interviews, talks, teaching series (e.g. pronunciation, punctuation), TV games (e.g. spelling bees, "What's my Line?", "Twenty Questions"), songs, dances, etc.

Given the nature of Iranian audiences, which are alert, sensitive, and critical, the thirty-minute programme, divided into two distinct and different fifteen-minute parts, has turned out to be rather a satisfactory length. Fifteen minutes are not enough for the viewers to lose interest, and the change-over from the Elementary to the Advanced level gives their interest further stimulation. Although fifteen minutes is not a very long time from the teacher's point of view, it is long enough for

him to put across at least one new sentence structure and half a dozen new words.

However enthusiastic teachers of foreign languages by television may be, they must not lose sight of the fact that in Iran both television itself and the teaching of English by television are still in their experimental stage. Although television may have its limitations as an instructional device, there is no doubt that the foreign language teaching programmes in Iran have stimulated interest both in the local Press and among the general public; the programmes have given the Iranians an opportunity to appreciate a foreign language and culture 'at home' and have served a useful educational purpose in a broad sense by presenting subject-matter that is both informative and cultural.

The most encouraging aspect of all concerning "English by Television" is a human and personal one, namely the genuine goodwill and enthusiastic interest that individual Iranians show in the programmes and their eagerness to express, by letter or by word of mouth to the teachers and organizers of the programme, their appreciation of the work that is being done.

JOHN GASCOIGNE MILLS.

The Radiophonic Schools of Sutatenza, Colombia

COLOMBIA is a country of 1,138,335 square kilometres with some 13 million inhabitants. There are 814 municipalities, nearly all of which cover a very large area, averaging 1,398 square kilometres each, with a small urban population and a very large majority living in widely dispersed mountain villages known as *veredas*.

60.5 per cent of the population is in isolated houses or farms, remote from any urban group, and dependent on difficult mule tracks for communication with the nearest town or village, which is often several hours' journey away.

The cultural background of the population is as follows: 650,000 inhabitants (5 per cent) with more than primary education; 2,340,000 inhabitants (7 per cent) with two to five years of primary schooling; 4,420,000 inhabitants (34 per cent) with one year or less of primary schooling; 5,590,000 inhabitants (43 per cent) illiterate.

Each year nearly half the children of school age fail to enter either state or private schools. In the rural areas the percentage of children failing to enter primary school is 66.4 per cent. A still more serious effect on the cultural life of the country, however, is the content of the school curriculum. Rural children who have become literate have received no instruction about the land and its products, or on the care of domestic animals, or on health, hygiene, food values, domestic economy, etc.

The Radiophonic Schools

These schools were not planned to compete with the state primary schools, but simply to help adult rural workers to improve their progress and integration into the national life. Initially, the radiophonic schools did not even teach reading and writing. The main objects were, and continue to be, to give the rural worker greater opportunities to widen his personality and to place him in a position where he can by his own efforts improve his standard of living.

The greatest methodological difficulty was to change the listener into the student, for it was found necessary to institute a real 'school'. After several experiments the system of having a local assistant (*auxiliar inmediato*) to act as intermediary between the radio announcer and the workers attending the class was found to give the best results.

The local assistant is a neighbour who can read and write, or who at least knows the alphabet and can read numbers. He does not have to teach anything. His job is to obey the simple instructions which come to him over the radio: "Point your stick to the red letter at the top of the page" . . . "Tell the student to show the letter 'O' on the black-board", and so on.

The Origin of Radio Sutatenza

In 1947, at the age of twenty-four, Father José Joaquín Salcedo arrived in Sutatenza to help the parish priest. There were only 165 people in the village, but 9,000 parishioners lived on farms four or five hours' distance away. Political strife and *chicha* (a drink made from fermented maize) had ruined the population and Sutatenza did not even possess a market.

The young assistant tried to win the friendship of the people by showing 16-mm. films, but they neither understood them nor were even interested. He proposed the building of a rural theatre and the project was quickly realized. The majority of the people, however, continued their daily life uninfluenced by his work and indifferent to the life of the community.

Father Salcedo was a radio enthusiast, his friends said radio-mad, and with the aid of his little 80-watt transmitter had spoken with radio-amateurs all over the world. He therefore thought of communicating by radio with the people of Sutatenza, and took three battery radio sets to the *vereda* of Irzon. These were the first workers that he spoke to by radio, and they were delighted.

The old and neglected house of the priest at Sutatenza collapsed, but the workers, already enthusiastic about the transmitter, soon rebuilt it by their own work and resources. To-day the building is the headquarters of the *Acción Cultural Popular* (Popular Culture Movement).

The Local Assistant

At a meeting of priests it was proposed that an attempt should be made to teach reading and writing by means of radio. The idea was well received and an experimental pilot school was established. The first results were not encouraging. Radio was apparently unable to take the place of the teacher. But it was noticed that a man who could only just read and write was able to act as an intermediary between the radio teacher and the students without himself having to teach anything. The first local assistant to put the experiment into practice was an old woman called Conchita. The system was studied for five years, and during this period assistance was given by experts from UNESCO. Not until May 1955, however, was it possible to distribute the first edition

of 300,000 copies of the specially printed and edited reader for adult students wishing to learn to read and write through the radiophonic schools.

The local assistants also help as intermediaries in other types of lessons. Above all, they have become the leaders of a rural movement of renewal and progress, serving as personal examples, and organizing and stimulating the students to greater efforts in the various projects.

The adult rural worker is unable to go to school, and it is for this reason that the school must reach out to him in the remotest *vereda*. It is never too late to learn when learning is given in homage to God. A total of 19,602 local assistants have made possible the organization of 18,160 radiophonic schools with 490,552 pupils. There are also 24,000 receivers installed in the country areas exclusively concerned with cultural programmes, but which cannot properly be called radiophonic schools as they lack local assistants or because they do not fulfil some other requirement of the organization.

Radio Sutatenza

At the time of writing, Radio Sutatenza operates five transmitters, one of 25 Kw., one of 10 Kw., and three of 1 Kw. Programmes lasting an hour are broadcast four times a day and consist of classes for reading and writing, arithmetic, religious and moral instruction, information on agricultural and livestock themes, and health instruction. The rest of the programmes are made up of cultural talks, news, music, variety, plays, sporting events, remote control programmes, and so on. These transmitters are also used for training rural teachers, for literacy campaigns for soldiers, and for those serving prison sentences.

In terms of hours, Radio Sutatenza broadcast the following items from January 1953 to December 1958:

Religious and moral instruction	507 hours
Reading and writing	2,030 hours
Arithmetic	580 hours
Social subjects	803 hours
Agriculture and stock breeding	1,400 hours
Special campaigns	720 hours
Catechism guidance	819 hours
News bulletins	990 hours
Plays	1,120 hours
Instruction for soldiers	780 hours
Rural teacher training courses	1,300 hours
General culture	595 hours
Music and variety	5,152 hours

The 42,174 receivers of the *Acción Cultural Popular* installed throughout Colombia are all one-station receivers and cannot receive

broadcasts other than from Radio Sutatenza. There is no electric power in the rural areas, and so the receivers are all worked by battery.

The organization operates in 864 parishes, a percentage of 66.4 throughout the country, and 98.5 per cent of the radiophonic schools operate in rural areas.

Services

The rural worker has only to acquire a receiver and batteries to have the right to the educational facilities. As a general rule, the receiver is bought by instalments and it is then installed in one of the rooms of a farm. Nearly all the schools have benches and tables for the use of pupils.

The ACPO sends, free of charge, reading and writing sheets, readers, agriculture and health textbooks, catechism leaflets, and special booklets on milch cows, poultry-keeping, pig-keeping, cesspits, trees for timber, bee-keeping, and so on. Up to December 1958 a total of 7,556,809 copies of the various publications had been distributed.

The students make their own blackboards, though they may be sent the black varnish with which to paint them and the chalk to use. Equipment for use in basketball games are sent when the field has been made and a team built up. Pencils, exercise books, and other necessities are also sent when required.

The local assistant must send in monthly statements of attendance to the diocesan office in order to receive the ACPO services. At the end of the course the results of the examination must also be forwarded.

Concept of Literacy in the Radiophonic Schools

The audio-visual system of the ACPO serves to teach reading and writing. Proof of this is the hundreds of thousands of rural illiterate workers who after a year's course of listening to Radio Sutatenza are capable of reading simple texts and writing their first letters. An average of 800 letters a day are received from past students with inquiries on a wide range of subjects.

The pilot schools and the soldier-teaching schools have, with the help of a local assistant, been able to achieve literacy in seventy-five half-hour lessons. The courses for rural workers last six months and are revised over a similar period.

Results achieved with teaching arithmetic are not so easy to define because the majority of the adult rural workers know how to count, add, and subtract mentally (or with the use of their fingers), and even divide small sums, but are usually unable to keep accounts. The teach-

ing of the four fundamental arithmetic operations takes forty to fifty lessons of fifty minutes each.

Fundamentally, however, literacy depends on more than just reading and writing, and Radio Sutatenza has programmes on religious and moral subjects, civics, citizenship, care of health, food values, community spirit, basic education against soil erosion, rotation of crops, seeds and seedlings, home gardens for vegetables, use of insecticides and fungicides, principles of cultivation, use of natural and chemical fertilizers, constructions of stables, pig-sties and chicken runs, use of the thermometer and veterinary syringe, etc., as well as friendly advice on household economy.

The directors of Acción Cultural Popular, an organization of the Catholic Church devoted to the culture of the people by means of the radiophonic schools, maintain that the basic literacy of the adult rural worker should consist of an integral minimum education, both human and Christian, which will promote conditions where progress can be achieved naturally. The acquisition of the skills of reading and writing is one of the ways in which these objectives can be achieved, but it is not the principal one.

The Movement to Improve Rural Life

The improvement of an isolated individual is difficult and unproductive because of the lack of stability, continuity, and stimulus in his environment. For this reason the radiophonic schools created an organization for further cultural progress. More than 700,000 people are reached by the broadcasts.

The local assistants meet once a month at the municipal headquarters, under the direction of the parish priest, to analyse the results from each school and to work out future plans. To supervise the work there are also parish assistants, most of whom have been trained in the *Institutos Campesinos de Sutatenza* (Sutatenza Rural Institutes).

Radio Sutatenza promotes campaigns to maintain the continued efficiency of the movement. For example, in the campaign to improve the home it was recommended that wooden or cement floors should be used instead of earthen ones; that the height of the stove (made of three stones) should be raised to one metre and that it should have an oven; that the roof of straw or grass should be replaced by tiles, asbestos-cement, or zinc; that the walls should be whitewashed; that the doors and windows should be painted; that the number of rooms should be increased by one or more; that a small garden should be planted round the house; that simple aqueducts of bamboo or similar material should be made to bring water to the house; that latrines should be built, etc.

Improvements to 22,500 houses to the value of several million pesos¹ have been made up to December 1958.

Another campaign resulted in 184,700 vegetable plots being planted with seed provided free, to make good the vegetable deficiency in the diet of the rural population.

An afforestation campaign resulted in the planting of 2,030,450 trees in a very few months. Unfortunately this campaign was insufficiently planned and more than a third of the trees were lost.

In 1958 community action resulted in the building of 3,689 aqueducts, most of them serving ten or twelve houses, although some serve the whole *vereda*.

Up to the present, 2,160 basketball fields have been made and 3,200 teams formed by students of the radiophonic schools.

Using the Indore system, 28,000 cesspits have been built in the last few years to serve as sources of manure.

It has not been possible to assess the number of roads and bridges constructed by students, although UNESCO has compiled an approximate figure of 14,299 for these items.

Sutatenza Rural Institutes

At the first general meeting of the ACPO, composed of all those priests who had organized radiophonic schools in their parishes, it was decided to establish the Sutatenza rural institutes, one for men and one for women. These institutes are housed in modern buildings and every three months a new contingent of students are sent by their priests to take the courses for the improvement of rural life.

The qualities looked for in these students are humanity, standing in the community, leadership, and a desire to work for the betterment of the community as a whole.

During four months of intensive study they learn practical things to pass on to their neighbours, such as personal hygiene, diet, improvements to housing, household economy, prevention of accidents, first aid, animal care, care of seeds and seedlings, construction of cesspits, stables, pig-sties, and chicken runs, rotation of crops, defence against soil erosion, pruning and grafting methods, use of insecticides and fungicides, use of veterinary syringe and vaccination, bee-keeping, and so on. Instruction is also given in community co-operation and organization. Much attention is given in the rural institutes to social and Christian education, as the only way to train leaders of character and responsibility.

Up to the present the rural institutes have trained 1,888 students,

¹ 6.40 Colombian pesos = \$1 = £0.35.

nearly all of whom help in the radiophonic schools as local assistants, that is to say, they supervise the local assistants.

Training Courses for Improving Agriculture and Livestock

The economic/social section of the ACPO plays an important role in the radiophonic schools. It aims to raise the standard of living of the rural population, but follows the principle that it is the population itself which must ultimately solve its own problems of improvement and progress.

In addition to classes and talks, this section has produced general and specialized agricultural pamphlets. To date it has published seventeen different booklets of 400,000 copies each. Each day it answers 200 questions sent in by listeners on agricultural and livestock problems.

One of the most interesting activities is the practical training course. When the parish priests of a particular area decide that the students have received sufficient theoretical instruction on a particular agricultural or animal husbandry theme, experts are invited from the ACPO headquarters to hold a week's training course. The experts demonstrate practical methods to the several hundred students summoned by the parish priest, which have already been explained theoretically by radio. Before leaving, the experts make sure that all the students have fully understood the practical aspects of the matters explained. For example, up to 1958 more than 15,000 rural workers had learnt to vaccinate domestic animals. Practical training courses have been given in 242 districts.

The equipment used by the experts is afterwards kept in the parish for use by the students, and consists of a clinical thermometer, veterinary syringes, grafting and pruning tools, bee-keeping tools, large quantities of insecticides and fungicides, special seeds, etc. The teaching of these teams has served to form the nucleus of a number of farm communities for experiment and training.

The Weekly Newspaper El Campesino

Some years ago a quantity of clandestine communist literature printed in Cuba was discovered, specifically directed to the newly literate students of the radiophonic schools. The danger of not supplying adequate reading matter to the students was perfectly obvious.

It was therefore decided to publish a weekly paper—*El Campesino*—to consist of sixteen two-colour pages devoted to the small farmer. In 1958 the circulation was 50,000, a figure difficult to exceed because of the existing machinery. In the early months of 1959, however, a Goss machine, capable of printing up to 300,000 copies, was installed.

The paper is printed in large lettering for easy reading, with simple

drawings and many photographs, and reaches the most isolated *veredas* and farms. All the issues have sold out and the demand is still great. The main features are a central pull-out section which can be pinned on the wall, articles on agriculture and animal care, editorials and commentaries on farming and rural matters, and a letter-page.

A series of farm booklets, at the price of one egg each, will shortly be published every week.

Other Activities of the ACPO

Of the teachers in the rural primary schools, 86.3 per cent have had no training other than the four years of primary schooling. Using Radio Sutatenza, the Ministry of Education has conducted programmes for the further training of these teachers. The courses last four years, and up to the present 6,500 teachers have taken the examinations.

Thirty-eight per cent of the soldiers called up for military service are illiterate. Acción Cultural Popular has undertaken to teach them to read and write in seventy-five lessons. Results of the examinations have shown that at least 88 per cent of the soldiers who take the courses have been able to read and write after the seventy-five lessons. Arithmetic and agriculture is also taught.

Special programmes are directed to the 158 prisons, and examination results show that 85 per cent of the prisoners passed the literacy examination after eight months.

The special courses for domestic servants and for urban districts of Bogotá, however, have not been successful owing to organizational difficulties.

There is an Acción Cultural Popular 10 Kw. station in Bogotá devoted to arousing the city's interest in the problems of the rural areas; and another station at Beleccito, the largest heavy industry centre of the country, to influence and help that part of the rural population that wishes to integrate more closely with industry.

PABLO M. OZAETA.

New Media and the Promotion of International Understanding

NEW media have certainly made possible the enlargement of social and political units. Such developments have in the past created a major problem; namely that of reconciling the interests of the smaller groups with those of the larger community. To-day the whole world is involved. Chauvinistic nationalism lingers on, but increasingly the sense of community has been extended from single nations to major regions of the world. Possible sources of conflict are now to be found between regional and world-wide interests.

If new media have helped to create the problem, the manner in which they are used might contribute to its partial solution. For new media are agencies of cross cultural contact. Selected information about one region is transmitted to the peoples of another. And in the process attitudes are built up in the minds of the recipients. Nationalism or internationalism can be promoted; war or peace encouraged; racialism or man's common humanity taught; tolerance or intolerance preached—the list is endless. It is consequently of fundamental importance, that if the community size is to be extended peacefully to encompass the world, new media should be used with a sense of responsibility.

In all the endeavours to promote international goodwill based upon knowledge and understanding, the work of the schools is vital. In some countries at least, new media, bringing vicarious experiences to impressionable young people, have become one of the most important agencies of education. Everywhere they are used in schools and adult education centres to fulfil a number of tasks. In less technically developed countries the building up of comprehensive mass media services is in process.

Two issues are considered in this symposium. One concerns co-operation in establishing new media services wherever they are needed. Associated with this task is the need to produce suitable material for school use. The second, and related, question is connected with the possibilities of furthering, through new media, good relations and better understanding between peoples of the world.

A number of agencies have directed their attention to one or other of these problems. Some are voluntary, others official organizations.

International, regional, national, and private bodies of both types are working in the field. Their activities might be classified under six main heads:

(1) Co-operation in the organization and development of new media services;

(2) mutual assistance in attempting to build up the use of mass media as educational aids;

(3) co-operation in the actual production of usable material in the form of programmes;

(4) arrangements for the exchange of films, and radio and television scripts;

(5) preparing programmes designed to provide information about other countries; and

(6) attempts to eliminate from books or presentations in the mass media elements which tend to stimulate war or ill-will between people.

In the first section of this symposium are presented extracts from an article by Mr. H. de Jong on the work of UNESCO. In the second section, Mr. H. J. L. Jongbloed provided the article on the international exchange of films from which extracts are taken. It deals with the work of regional organizations and particularly that of the Western European Union. The Editors are grateful to Mr. C. Gilliéron, who provided the material from which the information about the exchange of radio scripts is based. Finally, the section on improving textbooks is based upon an article written by Dr. G. Eckert.

BRIAN HOLMES.

UNESCO's Programme for Audio-Visual Media in Schools

IN UNESCO's work in developing the use of audio-visual media in school education, a distinction should be made between what is possible in technically developed countries and what is attempted in those which are not. The chief role of UNESCO is to stimulate and co-ordinate. Since funds are limited, projects have to be selected with the utmost care. One of its major activities concerns the removal of obstacles to the free flow of information. In less favoured countries the most formidable obstacle is a lack of mass media. Some aspects of the world-wide survey, undertaken by UNESCO at the request of the UN Economic and Social Council (Mexico City, April 1959) into ways of providing technical assistance in building up mass media services are described in the following way:

This survey is being conducted through a series of regional meetings of government representatives and media experts. UNESCO will submit its report and recommendations to the Economic and Social Council before mid-1961. This will enable the Council to evaluate the material, financial, and profes-

sional requirements and resources to carry out a general development programme, "including expert advice, fellowship awards, seminars, and the provision of equipment and other facilities".

For the implementation of this programme, more funds will clearly be required than are now available. In addition to present resources, funds might be obtainable through such channels as the newly created UN Special Fund for Economic Development. This would be a considerable step forward, as funds would thus be made available to aid the establishment and operation of information enterprises. Technical assistance has, in general, been furnished in the form of expert missions and training fellowships, with only limited funds being available for such items as equipment and materials for each project.

Nevertheless, in the past it has been possible to extend valuable help to a number of countries. Examples of these are Libya, where a team of technicians assisted in building up the country's broadcasting facilities, and Costa Rica, where a specialist advised the government on the possibilities of setting up a television service. Another example, of a different nature, was the UNESCO UNRWA pilot project on low-budget film-making. This project proved that it was possible to have at modest cost and with a small staff a self-contained film production unit doing its own sound recording and processing. It finally resulted in the production by UNRWA of a monthly newsreel for the refugee camps. This newsreel meets with increasing success.¹

UNESCO's assistance to member states has also been designed to promote the development of mass media for educational purposes. Generally speaking, most of these projects, since the Technical Assistance Programme was created, have dealt with visual aids for adult education. This remains true and there were in 1959 some fifteen UNESCO missions in the field. Policy has tended to change, so that only such projects were selected, (a) "where there was a reasonable chance that they could live on their own after three or four years", and (b) as would make "a contribution on the national rather than on the local level". Fellowships are provided "in order to enable those who have been trained by the mission to perfect their knowledge by studies abroad".

In view of the limited funds available, the author thinks that regional projects are still more important than national ones. He writes:

When the Regional Fundamental Education Centre in Latin America (CREPAL) was established in Mexico and the Arab States Fundamental Education Centre (ASFEC) in Egypt, visual aids units were attached to them for the training of field-workers in the use of those aids and for the production of prototype materials. But it was obvious from the beginning that this was not enough, and that these centres could never produce and distribute a sufficient quantity of materials to meet the needs of the region.

Therefore, with UNESCO's help, the Latin American Institute for Educational

¹ The results of this experiment will be published shortly in the UNESCO series, "Reports and Papers on Mass Communication", No. 29, *The UNESCO-UNRWA Pilot Project on Low-budget Film-making*. This and the following excerpts are from the full text of the authors' manuscripts.

Films (ILCE) was created by the Mexican Government in May 1956. The Institute, which covers both school and adult education, is now well established and has a large-scale production programme, particularly of filmstrips. During its first few years of operation it mainly served Mexican needs; now it is in a position to play a truly regional role, and this was one of the main topics of the UNESCO Regional Seminar on Visual Aids in School and Adult Education held in Mexico in the fall of 1959. The Seminar also provided an opportunity to consider the role of the Institute vis-à-vis the UNESCO Major Project for the Extension of Primary Education in Latin America.

UNESCO has been giving considerable assistance towards the creation and running of this Institute, much more than it could afford to extend to purely national ventures. It was felt, however, that regional centres have a particular role to play within the framework of international actions. Because of geographical, economic, and sociological differences, problems vary widely from one region of the world to another. Apart from the fact that it would be difficult if not impossible to serve all countries' needs from one central point, it would seem preferable as a matter of principle that the local needs for international co-operation be met on a regional basis.

UNESCO therefore welcomed the suggestion put forward by the Regional Seminar on Visual Aids for Fundamental Education and Community Development in South and South-East Asia which was held in New Delhi in 1958² that a visual aids centre for that region be set up.

If such a centre is established a good start would have been made towards the creation of a world-wide network of such centres, to be completed by others, e.g. in the Middle East and Africa. It would then be possible to establish inter-regional links, for instance, by providing opportunities for the leaders of these centres to meet regularly to discuss problems of common interest such as the exchange of programmes and the sharing of experience.

Most of UNESCO's work in the visual aids field in technically under-developed countries has been with filmstrips and non-projected aids. There is extended scope for work with television and radio. A number of pilot projects are now in operation, and others are being planned.³

In technically developed countries UNESCO is co-operating closely with international non-governmental organizations. Its co-operation with the International Council for Educational Films concerns amongst others the exchange and international co-production of teaching films, the commissioning of studies on the pedagogics of the visual media, the establishment of an international archive of teaching films and the teaching of film appreciation in schools. According to the

² A report on this seminar is available in the Unesco series, "Reports and Papers on Mass Communication", No. 27, *Visual Aids in Fundamental Education and Community Development*.

³ *Television and Rural Adult Education* (UNESCO, 1956); *Rural Television in Japan* (a report on an experiment in adult education); *An Indian Experiment in Farm Radio Forum*, by J. C. Mathur and Paul Neurath (UNESCO, 1959); *Canada's Farm Radio Forum* (UNESCO, 1954); *Education by Radio, School Broadcasting* (UNESCO, 1950); *Low-cost Radio Reception* (UNESCO, 1950).

author, the number of those who think that this discipline should find a place in the school curriculum, as has the teaching of literature, is constantly increasing. UNESCO has commissioned a member of the Council to prepare a study on this question. Another institution, the International Centre of Films for Children, created under the auspices of UNESCO in 1957, co-operates in these problems with the Council by encouraging the production, distribution, and exhibition of suitable entertainment films for children and adolescents. Through the International Council of Film and Television, brought into being under its auspices in 1958, UNESCO hopes to establish close working relations with the commercial, professional, and educational interests associated with film and television, thereby strengthening its own programme, "not least that in the field of education".

In conclusion, it might be said:

In this article no attempt has been made to introduce systematically the methods which UNESCO uses in the execution of its programme. It is hoped, however, that they will have become apparent. They consist of (a) the provision of expert assistance, of limited equipment and, in exceptional cases, of direct financial assistance; (b) the organization and operation of a fellowship programme; (c) the organization of pilot projects; (d) the convening of expert meetings and seminars; (e) the encouragement of research; (f) the co-operation with non-governmental organizations; (g) the carrying out of clearing-house functions, and (h) the running of a publications programme.

One point must be added to this list, i.e. the preparation of international agreements. Two such agreements are relevant to the subject under discussion. The first is the Agreement on the importation of Educational, Scientific, and Cultural Materials. Under this agreement certain materials, which include films, filmstrips, and recordings of an educational, scientific, or cultural nature, are freed from import duties. At the time of the writing of this article the agreement was being applied by thirty-one countries.

The second is the Agreement for Facilitating the International Circulation of Visual and Auditory Materials of an Educational, Scientific, and Cultural Character. Under this agreement, auditory and visual materials addressed to approved institutions may enter free of duty. So far, this agreement has been ratified by thirteen countries.

H. DE JONG.

International Exchange of Films

THREE points are made in the introduction to the article on the international exchange of films. In the first place, the author maintains, progress in educational film-making makes it necessary for producers to consider ways of distributing such films more widely. Secondly, producers should pay attention to suggestions about content from people not actively engaged in production. Thirdly, because film language, the language of images, "is generally a comprehensible means of communication for any pupil in any country" the necessity

of international co-operation through the exchange of films is obvious. The article deals with the work of organizations in producing and distributing films for primary and secondary schools (but not for higher education). In particular, it describes the activities of the International Council for Educational Films (ICEF) and the Working Party on Educational Films of the countries belonging to the Western European Union.

The ICEF comprises eighteen countries and is an association of "persons representing the educational film organizations of their respective countries". "By reason of their function," the author continues, "they are able to take far-reaching decisions on production and exchange of educational films." The Working Party on Educational Films has a rather more official standing, its members, drawn from the seven members of the Western European Union, act as delegates of their governments.

Both organizations are exclusively concerned "with the production and distribution of films made specifically for educational purposes". It is also possible to exchange through the Cultural Committees of countries belonging to the Western European Union, films which although not specifically designed for the purpose might be used in education.

The discussion of international co-operation in film production and the co-ordination of effort by the ICEF and WEU has been characterized as follows:

When discussing the exchange of educational films, we must distinguish between two kinds of films which are suitable for this purpose. By far the most important group consists of educational films which owe their production to international consultation. For example, ICEF has worked on, and is still working on, a number of projects covering the production of one, or a series, of educational films made by mutual consultation. The eighteen member countries of the ICEF, for instance, decided some years ago to produce a film entitled *Climatic Regions of Europe*. The script of this film was written, in consultation with the member countries, by an English expert on geography and climatology; the production was then put into the hands of four educational film organizations belonging to the ICEF: Institut für Film und Bild in Wissenschaft und Unterricht, Germany (FWU); Educational Foundation for Visual Aids, U.K. (EFVA); Institut Pédagogique National, France (IPN); and Aktiebolaget Svensk Filmindustri, Sweden (SF).

Design and animation were by Statens Filmsentral, Denmark (SF), and the director of the Skolfilmavdelning of SF in Sweden was appointed co-ordinator of the whole project.

The purpose of this combined production was to put at the disposal of the member countries, which together had made the production financially possible, colour-negative material from which each country would be able to produce its own version. Close co-operation between ICEF and UNESCO resulted, furthermore, in an important grant from the latter organization towards the costs of production. Thus a film which would have been far too

expensive in its conception for a single educational organization could be made available to a large group of interested parties. Some thousands of copies will be put into circulation.

At present a project is in progress for the production of a series of five films relating to the natural sciences. The production of these extremely costly films is made possible through considerable support received from the OEEC; the project will be executed by the educational film organizations of the U.K., Norway, Denmark, France, and the Netherlands. Co-ordination is in the hands of the director of the Educational Foundation for Visual Aids.

The project will be submitted for approval to all countries belonging to the ICEF which are interested in these films. After completion, distribution, by means of about 1,100 copies, will be made through the member countries of ICEF.

The Working Party on Educational Films of the WEU, after mutual consultation, has produced and distributed a number of films during the last six years.

Apart from these combined international productions, the educational film organizations regularly produce films which in the first instance are intended for distribution in their own countries. At the annual meetings of the ICEF these films, if they are made available for free exchange (this is usually the case), are shown and discussed. If desired, countries which are interested in the films can acquire them against payment of laboratory prices; they can then circulate them, if necessary after adaptation and further synchronization. Payment of film rights is waived in these cases. ICEF meetings as a rule occur only once a year, and consequently it is not possible to show all available films during these annual meetings. Therefore, specimen copies of films listed in the periodicals published by all educational film organizations can be obtained on demand in the course of the year; after approval by the receiving country, they can be bought. Here, too, no payments for film rights are required in many cases, owing to bilateral or multilateral agreements.

In 1959 plans were being worked out for the production of a series of films intended for instruction in foreign languages. These films will be produced by Germany, U.K., France, and Italy, while the other countries, which will of course take part in the distribution of the films, will support the productions by financial contributions.

In conclusion, the results of film exchanges are evaluated by particular reference to the position in the Netherlands.

The Stichting Nederlandse Onderwijs Film is the organization which represents the Netherlands in the ICEF and WEU. It keeps schools belonging to the Foundation informed of the foreign films available. With each film a comprehensive sheet of instructions is supplied for the teacher's use. This kind of service, it is thought, should be made available in other countries since there can be little doubt that interest in foreign films is very great. In the Netherlands, for example, some "49,000 films about other countries were distributed in 1958". Moreover, according to the author, "the greatest interest was aroused by films which give a picture of human relations in these countries"—an important fact to be remembered when future productions are planned.

A number of reasons, however, determine choice in the exchange of international films. Some of them are as follows:

In the case of the production of the film *Climatic Regions of Europe*, reasons mainly of a geographical nature led the member countries of I.C.E.F. to tackle this subject. It is very important that pupils from the far north of Sweden and Norway should have an idea of the climatological circumstances in which their fellow pupils of the Mediterranean are living.

A film made by the Swiss Educational Film, *Landesgemeinde Sonntag in der Schweiz*, which gives a clear picture of the way in which the voice of the people is heard in Switzerland, proved to be very valuable; e.g., for the German educational film organization, in its film programme designed to further the education of youth for democratic citizenship.

In all film exchanges, economic reasons of course play a great part. By the procedure described it is possible for a country producing a film—after consultation with other countries or not—to make the material available to all interested countries and to receive their films in return. Thus film organizations which generally, in view of their non-commercial status, have to work with limited film budgets, can provide a great number of educational films at a fairly quick rate.

Through the international co-operation in the field of educational films and the combination of forces working in this field, duplication in the production is, moreover, avoided.

The close contacts which have been established between the educational film organizations of many countries guarantee a maximum circulation of educational films over a maximum area.

In the near future it will also be possible, in view of the activity of international organizations such as the International Council for Educational Films, by these means to extend the existing co-operation—so far limited to Europe and North America—to the other continents.

The exchange of educational films will then contribute, in an even higher degree, to a better understanding among the many nations of our globe.

H. J. L. JONGBLOED.

International Co-operation in School Radio and Television

THE information provided from the office of the European Broadcasting Union illustrates how regional and unilateral agreements have grown up throughout the world to facilitate professional co-operation in the production of radio scripts and to promote international understanding. The data indicates that three main activities are undertaken. In the first place there is the straightforward exchange of recorded programmes or transcriptions. Secondly, there is the production and distribution of scripts or recorded material about some aspect of life in the country of origin. This service might be performed at the request of the receiving country, or through the co-operation of several countries. Thirdly, the teaching of languages by radio is important not only for itself but as a contribution to greater international understanding.

Regional Activities: British Commonwealth

In recent years considerable importance has been given by various British Commonwealth countries to the promotion between them of spiritual and cultural links through the medium of radio. In the past, teacher and senior student exchanges have been frequent, but the effect of these on school children is slow and limited in scope. Each country tends to teach about its own history and traditions and not about the Commonwealth. To fill this gap it was natural to turn to radio programmes. Most Commonwealth countries now have school broadcasting (largely modelled on the original pattern set by the B.B.C.). Hence co-operation is now feasible. Some of the special problems associated with it were discussed at Commonwealth Broadcasting Conferences in London (1952) and Australia (1956).

Efforts to establish school broadcast exchanges between the B.B.C. and Canada began in 1945. By 1948 Australia was participating, and after the first planning conference of Commonwealth school broadcasting held in Toronto to 1949, other countries joined in—including New Zealand, South Africa, Ceylon, and Pakistan.

One feature has been a transcription service which provides complete school programmes. An example of this kind of service is that of the B.B.C. Every year about seventy programmes are selected from the ordinary output of the Home Schools Broadcasting Department. Some modifications are made before the programmes are processed, issued, and catalogued as part of the normal Transcription Service. Commonwealth (and other) countries select from the catalogue and in turn make available transcripts of their own programmes. As well as regular exchanges many are on an *ad hoc* basis. Australian scripts accompanied by demonstration tapes have been forwarded, for example, to Japan, and the Schools Broadcasting Department of the Canadian Broadcasting Corporation has endeavoured to promote exchanges with the United States, but the characteristics of American production make their transcripts unsuitable for Canadian schools.

Since 1950 one section of the B.B.C. Transcription Service has been entirely occupied with the task of producing special school programmes for use in British Colonies. Some thirty different centres as far apart as the Bahamas, Zanzibar, and Hong Kong use these programmes. The whole project is supported by the British Colonial Office and financed by Colonial Welfare and Development Funds.

Valuable as transcription services are, other types of co-operation have been found to be necessary. Special programmes for exchange have been produced. Britain, Canada, South Africa, Ceylon, New Zealand, and Australia have participated. After agreement on a topic,

the countries wrote and produced their own programmes which were then made available to each of the other countries for broadcasting as a special project. A number of difficulties arose. Among others, varying age levels, different curricula, and speech differences were important. After the 1952 Conference a more flexible approach was adopted. A plan was prepared for the submission of material and topics to a central pool and unilateral exchanges of complete programmes based on these materials developed. Australia and Canada, particularly, exchange programmes designed to strengthen Commonwealth ties and to enrich the study of its geography and history.

After 1956, instead of each country selecting material and producing complete programmes to be circulated on disc to other Commonwealth countries for use in their own schools, it was thought wiser to provide basic material which could be made up into a suitable programme in the receiving country. Australia, for example, has issued portfolios containing radio scripts, a tape of appropriate sound effects, and a quantity of background material which could be used by other script writers to produce local programmes on "Australia and Wool" and "Australia and Water".

Then there are the programmes made up at the special request of receiving countries. Several broadcasting services perform this task. In 1950, for example, the B.B.C. started a service to Overseas Broadcasting Organizations, called the *Schools Script Scheme*, in which it undertook to make available on request copies of scripts selected from the entire output of domestic school broadcasts. Very extensive use has been made of this service, and an average of well over two thousand scripts are supplied during the course of a year. Countries regularly participating in the scheme are Australia, New Zealand, South Africa, Canada, India, Ceylon, Pakistan, Singapore, Nigeria, Ghana, Mauritius, Malta, and Barbadoes; and in Europe, Italy, Holland, and Belgium are also using the service.

Finally, the teaching of English by radio extends beyond the boundaries of the Commonwealth. In 1939 the first lesson was broadcast by the B.B.C. There is now a prodigious output of programmes which are heard in sixty-one countries of the world by audiences of many millions. Thirty-five languages are used for elementary and intermediate lessons. The lessons are broadcast direct from the U.K. or relayed by stations in nearly forty countries from recordings supplied to them. They can also be purchased abroad as gramophone records for use in institutes or by private persons.

Region Activities: the Northern Countries

Much the same kind of co-operation exists between the Northern

countries. Although to some extent on a wider scale as well, the links, for obvious reasons, are closest between Denmark, Finland, Iceland, Norway, and Sweden. Common history, similar social conditions, and the fact that the languages of three of these countries are generally understood, account for the close co-operation between them ever since school broadcasting began some thirty years ago. Naturally a good deal of time is devoted to programmes which not only present information but also acquaint pupils with the various spoken languages. It takes a Swede, for example, some time before he can follow Danish without difficulty. Every school year the Swedish radio transmits two series of programmes in Norwegian and two series in Danish. The Finnish Broadcasting Company sends out programmes including school children's songs from Denmark, Norway, Sweden, and Finland. Denmark's school radio broadcasts for the children in the seventh to ninth school year group, programmes on the national anthems of the Scandinavian lands. All the countries, thus, include items designed to reveal to school children important aspects of the life of their neighbours. Each of the radio divisions in Denmark, Sweden, and Norway records ten to twelve programmes annually on and from the other countries.

Language difficulties prevent the exchange of scripts on a large scale. The vocabulary has to be simplified, and the rate of speaking reduced before transcripts or recorded programmes can be used. So, for example, if scenes from Strindberg's dramas were to be broadcast in Swedish in Sweden, Denmark, and Norway, three different recordings would be necessary. In such cases a representative of the 'receiving' country would be present to ensure that the production met the specific requirements of the intended audience. In this and in other ways there is a good deal of personal contact between Scandinavian producers for the purpose of assisting each other in the arrangement of material for programmes on the history, geography, literature, and the social life of the Northern countries.

Mention should also be made of foreign language teaching, which takes up a relatively large proportion of the curriculum in Scandinavian schools. Until fairly recently all the programmes aimed at the Swedish secondary schools dealt with English, German, or French. International co-operation has now made it possible for the foreign language lessons to be made in the country of origin. Denmark, Norway, and Sweden have the same radio language lessons and share the costs of production. Programme themes are worked out together. The scripts are then prepared either in Britain (B.B.C.) or Germany (N.D.R.) or France (Radio-diffusion Française), and after being checked for vocabulary and content, recordings of them are then made. A Scandinavian producer is usually present to ensure that the programmes meet the local needs.

Each of the recording countries prepare textbooks with complete translations of the spoken words for use by the children in the receiving schools.

In all the Northern countries a number of programmes dealing with other nations or with international affairs is broadcast to schools. In some instances special features prepared by various agencies of the United Nations have been broadcast, on the Norwegian network, for example. Denmark's 1958-9 programmes contained items on at least seven other nations as well as one on human rights. Between 1949-59 school broadcasts in Finland included information on the work of the United Nations and on Canada, Australia, America, Greece, and Switzerland.

Unilateral Activities in Radio and Television

A number of other European countries operate an exchange of scripts in some form or other. The Hessian Broadcasting Company restricts its endeavours to obtaining information. Specific transmissions made by various school broadcasting services are used and adapted so as to be 'tailor-made' for use in the schools. Active personal contacts are maintained with non-German and non-European systems and publications are exchanged with them. Many of the programmes prepared in collaboration with foreign script writers are offered to foreign services. Oversea scripts are also used; particularly those of UNESCO and those suitable for adult audiences. Like Hesse, several countries make use of the International Radio University for the purpose of higher education. The Hellenic National Broadcasting Institute sent out in 1956 a series of programmes produced by I.R.U. on 'Greek Art'. Formerly it used B.B.C. English lessons and is now making, with the help of the B.B.C. under the cultural exchange programme, a broadcast entitled "Around the World in Fifty-two Days". A number of programmes about Greece have been supplied to other broadcasting services. The Austrian radio service co-operates on a unilateral basis with the B.B.C., the Canadian Broadcasting Company, and the U.S. Information Service. Programmes are either in English or in German. Exchanges cover three fields; news reports, geography and social life, and music and general culture.

In the United States of America the National Association of Educational Broadcasters regularly distributes programmes to member stations from the French Broadcasting Service and the British Information Service. Several foreign series have also been made available. The association publishes a catalogue of exchange programmes, although it is in no position to furnish scripts. As in many countries, foreign language teaching by radio is widely used. An example of this is the

course in Russian put out by the George Washington University Russian Department to over 3,000 people in the Washington area.

At present few countries have well-developed television programmes for schools. Those that have, particularly the U.S.A., Britain, and France, have attracted the attention of countries planning to set up school television. Sweden, for example, has carried out an extensive survey into the use of television for schools. No doubt Sweden, like other countries, will adapt the principles and practices of TV operation to her own requirements. Much, however, can be learned from the experiences of others in this field, and there can be little doubt that as television for schools comes into wider operation (with all its tremendous possibility for providing vicarious cross-cultural contracts), similar forms of co-operation to those which have grown up between the producers of radio broadcasts will evolve.

BRIAN HOLMES, based on material supplied by C. GILLIÉRON.

Improvements in Textbooks through International Co-operation

THIS last section reviews the attempts made principally since World War I to check and revise history textbooks. Although at times ridiculed as utopian, this movement to ease international tensions has gained ground and promises to become a system of world-wide co-operation. The author regards the problem in the following terms:

The experience of two world wars and the need to take up a position *vis-à-vis* the phenomena of the totalitarian state have demonstrated not only to educationists, but also to the general public, to what degree the results of historical studies can be misused as a means of propaganda or as raw material for the formation of ideologies of one kind or another. Since school textbooks exercise a lasting influence on young people at critical periods of their development by shaping their historical views and values, and may indeed determine them for the rest of their lives, it is not astonishing that such books have repeatedly been misused for purposes of propaganda, especially by authoritarian regimes. . . . In the 'One World' of the second half of our century, nations and groups of people, who formerly had practically no points of contact have become political, economic, and, not least significantly, cultural neighbours and partners. Therefore the development of the historical views of such peoples and nations, the thought attitudes they adopt towards history, and the traditions of the diverse religious, social, and political groups, are invested with interest and importance not only for them but also for their neighbours—and that means nowadays for the whole of humanity. The endeavour to achieve an objective account and interpretation of the facts, the efforts towards a mutual understanding even of fundamentally divergent attitudes towards history, the co-operation of historians and educators from the different geographical and intellectual spheres, can therefore contribute towards an attenuation of the antagonisms which endanger mankind. . . .

Parallel with the political development towards the 'One World' of the twentieth century, our historical thinking has been widened and become more

catholic, endeavouring to achieve a synthesis of the traditional science of history with archaeology, ethnology, and anthropology. While for the European historians of the nineteenth century the conception of world history was still synonymous with the development of the classical and the Christian Western world, there now appear the outlines of a truly universal history, embracing all peoples, races, and cultures.

The changed situation in the world and the fundamental metamorphosis in the historical picture we have of the world, force the schools and the authors of school textbooks to re-think the educational material transmitted by them with respect to its content and to its implied philosophy. To the original aims of the reform of textbooks—the easing of tensions between groups, efforts towards objectivity and tolerance, work for peace—there is thus added a new one: the endeavour to paint a panorama of the history of humanity which will do justice to the decisive contributions of all cultural regions of our earth, and communicate a feeling of a common human solidarity and fate, by recognizing both the unity and the multiplicity in the development of our cultures. . . .

One great problem is to shorten the period between the publication of research findings and the realization in practice of the new theories about unity and diversity in the development of cultures based upon them.

Revision of School Textbooks in the Inter-War Years

Some of the national, regional, or international attempts made between the wars to revise textbooks are reviewed in the following summary of a portion of the author's historical account.

Between the world wars many attempts were made by educators and scholars to educate the new generation in a spirit of tolerance and international understanding. Criticism was particularly directed towards chauvinistic school textbooks and nationalistic history teaching, a point which had been made in 1911 by the American historian Bushnell Hart when he wrote: "One of the chief obstacles in the way of better international understanding is the patriotic historian who brings into the limelight the prowess and conquests of his own race of people against rival races." Pacifist, humanitarian, religious, pedagogic, and trade-union groups in numerous European countries and in the U.S.A. became very active. France was not slow to participate in this movement. In 1919 at a congress of French primary school teachers in Tours, Anatole France turned against all books which "teach hatred". Later, after 1926, as the result of an organized investigation into all history textbooks used in the state schools the French Union of Teachers, the *Syndicat National des Instituteurs* objected to twenty-six publications which were withdrawn and rewritten. Two years later at the disarmament conference in Geneva the French Ministry of Education could report that the action of the teachers themselves had been so successful

that no legal action was necessary against chauvinistic textbooks. Other attempts were less successful. Among them might be mentioned the failure of the League of Nations' 'Casares Resolution' (1926) which envisaged completely voluntary, effective bilateral co-operation between member states. All subsequent attempts of the League became illusory as a consequence of the political developments of the 1930's. When in 1937 a 'Declaration on the Teaching of History' was agreed, war was in sight.

Limited success was achieved by semi-official regional attempts to foster good-neighbourly relations by multilateral revision of textbooks. Efforts in the Balkans and in the Baltic provinces were denied lasting success, but the work of the *Forening Norden* and its branches in Sweden, Norway, Denmark, Finland, and Iceland became a model for future work. The semi-official organization was founded in 1919 and aimed at strengthening Nordic feelings of solidarity and fostering cultural co-operation between member states. Obligatory interchange of textbooks for the purpose of eliminating tendentious passages was resisted but the principle of voluntary consultation was accepted. Between 1928 and 1932, when the question was again raised, it was decided that all school textbooks should be examined by a Joint Nordic Commission of Historians. This work has continued after an enforced interruption during the Second World War. It has resulted in a more balanced account of the history of all Nordic states. Moreover, the work has had a far wider influence, having given encouragement to efforts towards a general revision of school books everywhere. Especially in post-1945 Germany was the Scandinavian model influential.

Perhaps, between the wars, most historians with the exception of Marxists wrote from a nationalist viewpoint and efforts to revise textbooks were less concerned with a "re-thinking of global history, than with a fair, scientific account of the respective national histories. . . ."

In the United States a more optimistic view of the power of education to solve political problems and promote mutual understanding always seems to have prevailed. The following is a commentary on efforts in the U.S.A. and Latin America:

In 1921 the Carnegie Endowment for International Peace began an empirical investigation of the "spirit in which the school books most recently put into use among the ex-belligerent nations were conceived and written so far as the drama of 1914-18, its causes and its results, were concerned". This two-volume work, which became generally available in 1923-7, initiated a new branch of pedagogical research, the scientific investigation of school textbooks, a study which has gained in importance especially during the last decade, not least in Germany and Japan. Similar investigations were also undertaken by other American organizations. Parallel with these efforts, which correspond with those in Europe in the inter-war years, attempts were made to foster North

American or Pan-American solidarity and friendship; that is, a regional feeling of belonging to one community, with the help of the school textbooks.

In Latin America a bilateral, or, as the case might be, multilateral revision of school books at an inter-state diplomatic level had begun as early as the 1920's, especially after the Pan-American Conference of 1924.

In the middle of the Second World War the American Council on Education joined the Canadian Education Association for common work in this spirit of a good neighbourhood policy. The educational committee founded by them began, amongst other projects, the examination of school textbooks "to discover the extent to which national history textbooks used in the schools in Canada and the United States help the people of the two countries to know and understand each other" and "to offer recommendations based on facts discovered for the improvement of national history textbooks as instruments of international good will between Canada and the United States". . . .

The dramatic rise of the U.S.A. to a position among the three leading powers in the world brought new and increased responsibilities for the American educationists. The authors and publishers of American textbooks were thus faced by a difficult task with respect to content and to method. Their own textbooks were analysed by the respective countries in sweeping unilateral investigations, applying both quantitative and qualitative criteria to the scope and spirit of the accounts dealing with the history, geography, and culture of Canada, of the Latin-American region, and especially to those dealing with the Asiatic world. The result of these comprehensive studies, in which Howard Wilson took a leading part, were publications breaking new ground in content and method, such as *The Treatment of Asia in American Textbooks*. The publications about Asia, in particular, can be regarded as valuable precursors of UNESCO's endeavours to achieve a better understanding between Asia and 'the West'.

In a nation composed, like the United States, of numerous ethnical and racial groups, of different linguistic and denominational communities, it is obvious that regional, racial, religious, and social antagonisms and their reflection in school books are no less important than the international differences with nations from whom the U.S.A. is usually separated by the width of an ocean. It is therefore not surprising that the elimination of tensions of this kind (North-South, Coloured-White, Protestant-Catholic-Jewish, Established American-Immigrants, etc.) occupy the centre of the stage in the American attempts at reform of school textbooks. Similar investigations have recently been undertaken in Europe, too; as for instance in Great Britain (by the Council of Christians and Jews) and in Germany.

Revision of School Books after 1945

Conditions in the immediate post World War II period encouraged the hope that more attempts to develop international understanding would arise. The following are some of the national and regional efforts:

The political and ideological situation in the first years after 1945 gave rise to hopes for increased international efforts towards mutual understanding within the framework and in the spirit of the United Nations. On a wave of general optimism for the future and of longing for peace, UNESCO resumed the educational endeavours of the 1920's. At two large conferences, held in

Brussels and Sèvres, experts from all over the world met in 1950-1 to discuss the resumption and intensification of the revision of school books at an international level. One of the most valuable results of these meetings were the numerous personal contacts without which the revision of school books could hardly have started so quickly and effectively in Western Europe. In addition to UNESCO, numerous other educational and humanitarian organizations worked towards the same goal, amongst them the Historical Association in Great Britain, the National Council for Social Studies in U.S.A., the World Brotherhood, the international unions of teachers' associations (F.I.A.T. and W.C.O.T.P.), as well as individual associations in different states of Europe. The school book revision in post-war Germany, however, was to gain special importance. . . . After the experiences of the totalitarian regime, the striving for truth, tolerance, and the highest possible degree of scientific objectivity, was for the German historians and educators a fundamentally moral problem, one of the pre-conditions for the resurgence of German democracy and for a realization of the European-humanitarian vision aimed at by the best forces in the German resistance movement. In these circumstances it was no accident that the initiative came from the representatives of the organized German teachers. As early as 1947 the Working Party of German Teacher Associations (*Arbeitsgemeinschaft Deutscher Lehrerverbände*), which by now has more than 100,000 members, decided to join in the work for a thorough reform of the teaching of history and for the revision of the school textbooks. Thanks to the encouragement and disinterested support of enlightened, tolerant educationists in Great Britain, France, Scandinavia, and the U.S.A., the psychological obstacles to co-operation with Germany, arising from the dreadful experiences of the war, were successfully overcome.

A few years later, the German organization worked in close partnership with associations of teachers and of teachers of history, with national groups of delegates to UNESCO and groups of historians from nearly all Western European and numerous extra-European states. As the work expanded and intensified, it proved desirable to create a permanent centre with an international collection of textbooks, syllabi, and such like. With the support of the teachers and the government, there thus came into being the International Institute for School Textbooks (*Internationales Schulbuchinstitut*) in Brunswick which, as a completely independent academic institution, became the German rallying point for all relevant efforts. On a completely voluntary basis more than 1,000 textbooks for history, geography, and languages came to be exchanged in the years to follow with the partner organizations in Europe and overseas, and to be analysed in co-operation with them. . . .

The success of the revision of school textbooks in Western Europe cannot be understood apart from the background of the Pan-European movement of the 1950's. The consciousness of the cultural ties which had been intensified, in spite of many political setbacks, made it easier to look beyond national peculiarities to the unifying common heritage. Historical studies developed in a sense parallel to this tendency towards a European synthesis (that is, in medieval studies, in the researches into the underlying anthropological and ethnic unity of Europe and in its cultural, social, and economic history); this fostered further a more dispassionate and relativistic view of the formerly purely nationalistic interpretation of history.

Thanks to the initiative of the Council of Europe in Strasbourg, these tendencies made themselves felt in the revision of school textbooks as well. Six multilateral conferences convened by the Council of Europe analysed and

discussed the treatment of the common European heritage and data as well as of the individual historical and cultural developments in the textbooks of European countries. On the basis of very thorough preparatory work, recommendations were formulated for the treatment of the common European history from the Middle Ages to the beginning of the twentieth century. Those taking part were fully aware of the potential dangers—e.g. misuse of history for European propaganda, however well-intentioned, might shift nationalistic attitudes from the regional to the European level. . . .

An ever-growing number of publishers has decided to use the good offices of the International Institute for submitting manuscripts of new textbooks, before they are printed, to foreign experts for their comments and, if necessary, corrections. In various publications in recent years authors and publishers, in a special note, draw attention to this voluntary co-operation in international self-censorship of school book authors and teachers of history. The associations of the Nordic states, the French *Syndicat National des Instituteurs*, the French and Belgian teachers of history, as well as the school textbook committee of the British UNESCO commission, have organized corresponding bilateral exchanges of school books.

The numerous bilateral conferences of historians, where teachers of history from universities and schools and authors of school textbooks have discussed moot points of their common history, have proved at least equally important. The Institute in Brunswick alone has so far convened thirty-one such conferences. Most of these meetings were concerned with problems of the nineteenth and the beginning of the twentieth century, conflicts and rivalries in the age of national states, the era leading to the First World War, the policies in the 1920's and similar difficult questions weighing on the minds of the European peoples when they considered their history. At meetings of German historians with colleagues from Austria, Belgium, Holland, Yugoslavia, Luxembourg, and Norway, problems of recent and very recent history were outlined—from the rise of the totalitarian dictatorships to the end of the Second World War—in discussions that were as frank as they were considerate of other people's feelings, and provisional recommendations were drafted. Other historians discussed questions of medieval history. The recommendations jointly arrived at by such conferences have been published in numerous monographs and made available especially to publishers, to authors of school textbooks, and to a great number of teachers in the German-speaking regions. . . . We may hope that at future multilateral conferences it will be possible to discuss the treatment of historical periods, phenomena, and motivations that are common to all or at least to several European nations. (The programme of the International Commission for the Teaching of History constitutes a first step.)

Regional co-operation, corresponding to the *Forening Norden*, was initiated by the history teachers of the three Benelux countries at a conference in Luxembourg, when they agreed amongst other things on a common draft syllabus. Finally, historians from the states of the Eastern Block (from U.S.S.R., Poland, Czechoslovakia, the German People's Republic, and others) have discussed at common conferences and in bilateral commissions problems of modern and very recent times—e.g. of the Second World War—on the basis of the materialistic interpretation of history. The conclusions arrived at must undoubtedly gradually influence the textbooks published by state publishing firms in the countries under a communist regime.

In what has gone before, the discussion described regional attempts *Eastern and Western Cultural Values—the UNESCO Project* to improve textbooks and mutual understanding. There are to-day, however, formidable problems of living together in 'One World'. In general, these turn on the possibility of peoples of the world from whatever part coming together in peaceful co-operation and understanding. The following excerpt is an account of UNESCO's role in promoting this aim :

The fact that history now embraces all peoples and periods in the story of mankind, and even more forcibly the emancipation of the Asiatic and African peoples, compel us to reconsider all the fundamental questions concerning the teaching of history—from the apportioning of the material and the division into periods to the methods and values involved.

The young nations of Asia and Africa for their part are faced with the enormous task of formulating in as short a time as possible the historical concepts necessary for a completely new literature of school textbooks. It is obvious that the picture of the history and culture of the peoples of the West communicated thus may prove to be decisive for the future relations of the three continents.

To UNESCO the credit is due for having recognized at an early stage the new tasks arising for the revision of school books and for having taken them into account within the framework of the "Major Project on Mutual Appreciation of Eastern and Western Cultural Values". As early as 1956 this made it possible for historians of the West to discuss with colleagues from Asia the treatment of Asiatic history and culture in the school books of Europe, the U.S.A., and the U.S.S.R. At a second, and even more important, conference in Tokyo (1958) the attempt was undertaken to discuss the picture of the West as presented in the school books of Asia.

In close co-operation with the Major Project, various European and American National Commissions for UNESCO (especially in Great Britain, U.S.A., and Germany) have worked towards bilateral co-operation with UNESCO commissions, school book authors, groups of historians and teachers in Asia and Africa. Thus textbooks were exchanged and commented upon, conferences of historians were arranged (e.g. between Japan, India, Indonesia, and Germany), recommendations for authors of textbooks and teachers of history were worked out, and the other methods tested in Western Europe were applied. In some Asiatic states centres for school textbooks were founded (e.g. the Governmental Textbook Research Bureau in Delhi, the private International Society for Educational Information, with somewhat different aims, in Tokyo). Besides advising the authorities, publishers, and authors in matters of technique and method, these also aimed at propagating the international revision of school textbooks. The UNESCO Congress in Tokyo recommended the multiplication of such centres, which are invested with special significance in regions where the educational system is under state control, and further, the founding of a central autonomous institute for school textbooks at a university in South-Eastern Asia, where it should work in complete academic freedom.

Criticism of the International Work on School Textbooks

In conclusion, some points of criticism are referred to which have to do with the international work on school textbooks?

Although the international work on the revision of school books is gaining increasing public approval and support, there has been no lack of objections—as was only to be expected. Some of the doubts expressed are based on obvious misunderstandings or do not touch questions of principle; others, however, deserve to be taken more seriously. Great Britain especially showed concern, lest international agreements about the aims, contents, and methods of the teaching of history might, or would necessarily, lead to a limitation in the freedom of teaching and instruction. The formation of supra-national committees of historians might represent the first step towards governmental *dirigisme* and censorship in education. Further, the participants of such international conferences might be more strongly influenced by the will towards international reconciliation than by the determination to serve only historical truth. The truth would be a 'diplomatic' account of history in the interests of peace, mutual understanding, European unification, or of other noble and admirable aims, which, however, were not compatible with the demand for the supremacy of scientific truth. . . .

It has to be admitted that this danger exists especially in situations where the revision of textbooks is exclusively in the hands of governmental or other ideologically tied institutions and organizations. It should, however, be possible to avoid it in all cases where independent scholars and educationists, accountable only to themselves and their consciences, take responsibility for the work. The participants in all the West European discussions of historians have repeatedly emphasized that they only speak in their own names and that their recommendations can claim only such authority as scientific criticism is willing to grant them on their intrinsic merit. . . .

Communist representatives have repeatedly asserted that the promoters of school book revision in Western Europe were less concerned with historic truth and understanding between the peoples than with the propagation of the ideology of a European alliance and block; historic feelings of resentment between former opponents were being eliminated in order to smooth contemporary political and military alliances. The Western German historians are further reproached with attempts at a 'relativization' of the German national consciousness in favour of a cosmopolitan attitude of mind, in order to foster a "subjugation of Western Germany" to foreign powers. It cannot be denied that the school book revision has profited from the movement towards European co-operation and that the results of this revision in their turn have fostered the 'rapprochement' of the European peoples. A glance at the history of the school book revision shows, however, equally clearly, that it is older than the policy of European unification, that its development can only be understood from its scientific and ethical standpoint, and that—last but not least—it has always endeavoured geographically and culturally to go beyond the confines of Europe. . . .

Under the heading "The International Movement of Nationalists", Tritsch criticizes the efforts made so far as being too superficial. As long as the concepts used in bilateral talks were not defined completely without ambiguity, there was a danger that the teachers would interpret the joint recommendations to mean, in every case, what was acceptable to them and to their nation. Instead of rising to a higher, more objective, point of view, the nationalists would simply find themselves confirmed in their nationalism. . . . Dangers such as these have caused the Council of Europe to define the terms used in the teaching of history in the European countries and to publish them with their variants in a dictionary destined for authors of school books and teachers of history.

Others have expressed concern lest a European or global expansion of the historical picture would endanger education in a legitimate patriotism and national consciousness. Let us reply to this rather superficial argument with the words of the great French protagonist for school book reform and international understanding, Georges Lapierre: It is the conviction of the French teachers "that one only serves the national community well if one ties one's future to that of the peaceful community of mankind". The educationists taking part in the revision of the school books know that one can only respect, esteem, and love other peoples if one respects and loves one's own town; they try to educate their young people towards four steps of loyalty: the love and devotion to their own part of the country, to their nation, to Europe, but also to a feeling of integration and active solidarity with all men, in the sense of Leonid Tolstoy: "The nearer men are to truth, the more tolerant they are—and vice versa!"

G. ECKERT.

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